

APPENDIX A  
PROPOSAL AUTHENTICATION FORM

**TITLE:** Decision Support Tools and Predictive Analytics in Human Services

**DUE DATE:** APRIL 18, 2014

The undersigned hereby offers to furnish and deliver the services as specified in strict accordance with the RFP and scope of proposal, all of which are made a part of this request. This offer is not subject to withdrawal without permission of the County of Allegheny Department of Human Services Director.

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**DOING BUSINESS AS:** The Kempe Center

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**Chapter 2**  
**COMPANY INFORMATION**

(This information is for tracking purposes only and has no role in the determination of the responsible proposer.)

☐ Check here if your firm is registered with the Allegheny County Department of Minority, Women and Disadvantaged Business Enterprises

☐ Check here if your firm is a "Minority Business Enterprise" or "MBE" as defined in the Small Business Act, 15 USC

☐ Check here if your firm is a "Women Business Enterprise" or "WBE" as defined in the Small Business Act, 15 USC

☐ Check here if your firm is a "Small Business" as defined by the Small Business Administration (13 C.F.R. 121.201, in most cases, this means a business with 500 or fewer employees)

**NOTE: THIS PAGE MUST BE SUBMITTED WITH YOUR PROPOSAL. ALL PAGES REQUIRES A LIVE  
SIGNATURE SIGNED IN BLUE INK.**

## **REQUEST FOR PROPOSAL BID**

### **DECISION SUPPORT TOOLS AND PREDICTIVE ANALYTICS IN HUMAN SERVICES**

*The Kempe Center for the Prevention and Treatment of Child Abuse & Neglect,  
Department of Pediatrics, School of Medicine University of Colorado, Anschutz Campus*

*13123 East 16th Avenue, B390, Aurora, Colorado 80045*

*April 2014*

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## 1. EXECUTIVE SUMMARY

This proposal describes a decision support project collaboration that includes the Kempe Center for the Prevention and Treatment of Child Abuse and Neglect (Kempe) and its partners, Chapin Hall at the University of Chicago (Chapin Hall), Intelligent Outcome Analytics (IOA), and Pierson Computing Connections. Key staff include our CO-PIs; John Fluke, with the Kempe Center who will also serve as the main point of contact, Fred Wulczyn with Chapin Hall, and David Schwartz with IOA. In addition we will subcontract with Pierson Computing Connections, a Pennsylvania Department of General Services certified woman business enterprise (WBE), for technical purchase and support. Kempe staff are known for their groundbreaking research using an ecological approach to understanding factors affecting child welfare staff decision making and its relationship to the assessment and prediction of child welfare outcomes. The scope of Chapin Hall's research and the variety of contexts in which that work is conducted leave Chapin Hall staff with a firm appreciation for the challenges inherent in developing, implementing and evaluating programs designed to enhance the functioning of child welfare systems with the ultimate goal of improving safety, permanency, and well-being outcomes for children and families. Kempe, Chapin, and IOA staff all have substantial experience using a variety of administrative data systems.

A major and extremely complex challenge for decision making in social services is to determine how the needs of high risk populations can be optimally served to maximize outcomes at the system level. In other words, how can participants be meaningfully classified with regard to needs, and connected to services that are most likely to be effective?

Our solution is to develop a decision support approach consisting of three integrated components: computerized adaptive testing/assessment (CAT-MH), intelligent outcome management and assessment (predictive modeling), and agent based simulation. The conceptual approach builds on technologies that the project team has developed and utilized individually in other settings. The concept is that data from the CAT-MH will be combined with other administrative data including other assessments where they exist to support the SPSS Modeler, these data in turn will help to define need clusters where the assessment and administrative data regarding service delivery for the clusters can be used to define baseline parameters for agent based simulation and resource allocation for evidence based or supported interventions. The intent is to develop a detailed design and test a proof of concept for two high-risk populations; adolescents in or at risk of foster care, and elders who are psychiatrically hospitalized or at risk of hospitalization. A focus of the project planning and evaluation process is to determine how the three tools can be integrated into the current DHS IT infrastructure including COGNOS.

Our collaboration is proposing to conduct the first year design and proof and concept process described in the proposal for \$ \$756,743.

## 2. PROPOSAL NARRATIVE

### *Description of Organizations*

This section describes a group of organizations and individuals coming together as a collaboration and describes our organizational capacity, experience, and compatibility with respect to a proposal for a successful design and proof of concept of data systems that support social service decision-making. The collaboration includes the Kempe Center for the Prevention and Treatment of Child Abuse and Neglect (Kempe) and its partners, Chapin Hall at the University of Chicago (Chapin Hall), Intelligent Outcome Analytics (IOA), and Pierson Computing Connections. It also describes our collective substantive experience in development, implementation, evaluation, and research in social services. The Kempe Center is the lead organization on this proposal and will be the point of contact for the County. That said, the organizations and consultants on our team constitute a collaborative approach. Each team member will make a unique contribution to the proposed project, and leverages many years of experience in the development of decision support. In turn the strengths, compatibility, and contributions of each of these partners in our collaborative makes us uniquely suited to propose this work.

#### **1) Organizations' history and experience conducting research, translating research into practice, developing/validating tools built on research, developing and implementing predictive models.**

##### *The Kempe Center for the Prevention and Treatment of Child Abuse and Neglect*

For 40 years, the Kempe Center has promoted understanding, knowledge, and best practices to prevent and treat child abuse and neglect locally, nationally, and internationally. Kempe fulfills its mission through research and evaluation; training, technical assistance, and education; and service delivery, advocacy, and consultation. Kempe is administratively located within the Department of Pediatrics at the University of Colorado Anschutz Medical Campus in Aurora, Colorado. Kempe's 80 faculty and staff are experienced in designing, implementing, evaluating, and disseminating a wide range of evidence-based programs and initiatives (e.g., differential response, trauma-focused mental health treatment, family group decision making, risk and safety assessment, and community-based child abuse prevention) to prevent and treat child abuse and neglect as well as improve the health and well-being of children and families. When several staff members from the American Humane Association joined the faculty of Kempe in 2012, their addition made Kempe distinctive among similar organizations in the United States and internationally by increasing its breadth of expertise related to child welfare practice, policy, and research.

The expertise and accomplishments of Kempe's faculty reflect a deep commitment to conducting research and translating it into practice. With respect to the work proposed herein, Kempe staff are known for their groundbreaking research using an ecological approach to understanding factors affecting child welfare staff decision making and outcomes. This experience includes 1) the identification of case factors that influence the likelihood that child maltreatment will recur or that families and/or children will be the subject of repeat referral or re-reports; 2) the identification of agency, worker, and case characteristics' that influence decision making

practices, 3) the impact of policies, practices, and demographics on states' child maltreatment recurrence rates, and 4) using research findings to develop safety and risk assessment tools, training, and policies. These efforts have yielded tools and models that predict variations in outcomes from the individual to the aggregate level. Moreover, the development and application of these and other analyses have involved the specification of data extracts from child welfare, mental health, health, benefits and other information systems in many states, construction of event data, and the use of a range of predictive analytic procedures. Kempe staff are well-versed in a variety of methodological approaches and have lead studies involving randomized control trials, propensity-score comparisons and other quasi-experimental designs. Other specific program and system evaluations conducted by Kempe staff include the impact of differential response, family group decision making, and factors influencing child welfare disparities.

Moreover, members of the Kempe Center research team are particularly skilled at the use of administrative data and utilizing the resources of multiple data sources for the assessment and prediction of child welfare outcomes. Kempe staff has substantial experience using a variety of administrative data systems including State SACWIS systems and the federal NCANDS and AFCARS data sets; and 2) Foster Care Redesign for the Texas Department of Family and Protective Services (2010–), in which Kempe and Chapin Hall collaborated to use the Texas SACWIS system to support modifications to the financial system for reimbursing out-of-home service providers. The depth and breadth of their experiences reflects a firm commitment to the use of information technology to inform policy and practice decisions, advance the understanding of workload, develop models of agency finance and costs, improve outcomes, educate, strengthen, and transform agencies.

#### *Chapin Hall at the University of Chicago*

For more than 25 years Chapin Hall has focused on building knowledge that improves policies and programs for children and youth, families, and communities. The scope of Chapin Hall's research and the variety of contexts in which that work is conducted leave Chapin Hall staff with a firm appreciation for the challenges inherent in developing, implementing and evaluating programs designed to enhance the functioning of child welfare systems with the ultimate goal of improving safety, permanency, and well-being outcomes for children and families.

Chapin Hall is a nonpartisan policy research center that provides research and technical assistance services to federal, state, and municipal governments as well as philanthropic foundations on a wide spectrum of issues including performance-based contracting, service system use, and measurement of child well-being. Chapin Hall also examines, evaluates, and documents initiatives that seek to support youth development and build the capacity of neighborhoods, community organizations, schools, and families to care for their children.

Chapin Hall is a national leader in the development of knowledge about the experiences of children in foster care. Approximately 20 years ago, Chapin Hall developed the Multi-State Foster Care Data Archive (FCDA), a repository of administrative data provided by child welfare agencies in more than twenty states. The Archive includes the foster care placement histories of nearly three million foster children. With the recent additions of Texas and California, the data include about 70 percent of the nation's foster care population. Due to the unique methods for storing individual level information, considerable analytic capacity is embedded in the data

archive. The flexible file structure permits a wide range of questions, lends itself to a variety of research methods, and when appropriate, can easily expand to incorporate information across domains. To facilitate access to the data, researchers have developed interactive tools to extract data for the purpose of data mining. The tools are expressly designed to distribute access to the data to a broad cross-section of child welfare professionals operating inside the child welfare system. This Data Archive forms the core resource of the Center for State Foster Care and Adoption Data (State Data Center), a partnership of the American Public Human Services Association (APHSA) and Chapin Hall, which was established to bring member child welfare agencies cutting-edge information technology for performance measurement.

Chapin Hall staff are also accomplished at performing outcome evaluations for human service agencies using complex and multifaceted administrative data. The bulk of Chapin Hall's work with public child welfare systems is done through Chapin Hall's Center for State Child Welfare Data, described above. Using the FCDA, Chapin Hall staff have studied, among other topics, child welfare outcomes pertaining to racial disparity in the child welfare system, the experience of infants in foster care, the circumstances of youth aging out of foster care, and the intersection of child welfare with other child- and family-serving systems such as the courts and the education, health, and mental health systems.<sup>1</sup> Additionally, FCDA data are uploaded to a user-friendly, web tool (also developed by Chapin Hall researchers) that enables staff from participating state agencies to answer their own business questions about systemic trends and outcomes for children in care using the agencies' own administrative records.<sup>2</sup>

Among Chapin's most recent accomplishments, State Data Center staff recently completed a comprehensive link between foster care and Medicaid data. The link is at the individual, claim, and placement level. The data account for \$2.6 billion worth of Medicaid claims, which are retrievable on a person, placement/facility-specific basis.

#### *Intelligent Outcome Analytics (IOA), LLC*

IOA is a Pennsylvania-based firm formed to help key decision-makers rigorously build and deploy analytic tools and predictive models that can be plugged into dashboards, decision support tools, and data warehouses. IOA leverages teams of interdisciplinary subject matter experts to support the process thoughtfully and cost-effectively.

IOA's founder and CEO, David Schwartz, has led several predictive analytic modeling engagements, including projects for the New York Office of Children and Family Services, Tufts Healthplan Foundation, the Gap Foundation, etc. Consultants and staff from IOA are experienced in developing and deploying predictive analytics. These include applications in Juvenile Justice and Child Protection.

#### *Pierson Computing Connection*

Pierson Computing Connection is a strong and experienced team able to perform technology implementation; software and hardware. The PCCi team provides significant experience, a trustworthy team and a commitment to customer satisfaction. PCCi has more than twenty years experience in performing large scale deployments of IT hardware and software and is located in

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<sup>1</sup> For more information on this research program, see <https://fcda.chapinhall.org/building-the-knowledge-base/>

<sup>2</sup> For more information about this technical assistance program, see <https://fcda.chapinhall.org/knowledge-in-action/>.

Mechanicsburg, PA. During the last ten years PCCi has installed more than 130,000 PCs for customers throughout the east coast, including more than 30,000 within Pennsylvania. PCCi is a designated IBM software vendor for the IBM SPSS brand.

The PCCi project management team has combined experience of more than forty years of experience managing local projects. Project Executive Debra Pierson, and Project Manager Janese Shenk, lead a team that works closely together to meet client needs with excellence. They are supported by Kristen Mitchell, PMP, and by our administrative team; experienced staff project managers who assist with every level of project detail. PCCi is a Pennsylvania Department of General Services certified woman business enterprise (WBE) and headquartered in a designated enterprise zone, PCCi specializes in providing hardware and software, project management and deployment services.

## **2) Relevant experience in working with human services practitioners.**

The staff from the Kempe Center, Chapin Hall, IOA, and PCCi slated to work on this initiative have a well-established track record of working effectively with human service practitioners serving a variety of roles in supporting the development, implementation, and assessment of human service provision. Staff for this project have worked with human services practitioners at all levels, in virtually every state in the U.S., and in numerous international contexts. Staff from each of these entities are quite familiar with processes and pertinent questions related to engaging government analysts in identifying administrative data resources and existing sources of relevant information, obtaining relevant input and feedback from executive to front line staff, and understanding the specific organizational culture that underlies the context for a work project.

More specifically, in addition to the FGC work described above, the Kempe Center has just completed a five year, federally funded project evaluating the implementation of differential response in child welfare systems in Ohio, Illinois and Colorado. Kempe staff also have a well-established and ongoing working relationship with the Colorado Department of Human Services and is in the midst of developing an evaluation method for assessing the delivery and efficacy of services to families screened out of the child welfare system. Kempe currently works with the Utah Department of Social Services as a member of the Title IV-e waiver evaluation team headed by the University of Utah's College of Social Work Social Research Center (SRC). Kempe has also supported efforts of Larimer County Social Service in Colorado, the Texas Department of Family and Protective Services, and the South Dakota Department Social Services in the development of an evaluation framework, monitoring system, and assessment of their family group decision making programs.

Kempe staff are highly accustomed to working with the myriad professionals across the multiple systems that work to protect children and support vulnerable families. Kempe staff have conducted focus groups, interviews, and surveys with a range of public and private child welfare staff (administrators, program directors, supervisors, caseworkers, information technology staff and analysts, administrative staff, and volunteers) at federal, state, and county levels. Given the interconnection between the formal child welfare system and other human service systems, the Kempe team has also acquired significant experience gathering information from and involving



other stakeholders, including parents/caregivers and representatives from mental health, substance abuse, prevention, juvenile justice, courts, and developmental disabilities. Kempe staff will draw on these experiences as they collaborate with Chapin Hall, IOA and PCCi staff to develop the decision support and predictive analytic tools described below.

### *Chapin Hall*

Given its extensive work conducting evaluations of public child welfare systems, Chapin Hall staff has vast expertise in analyzing the effectiveness of large government service programs administered through multiple funding streams. Because Chapin hall has experience evaluating programs at the national, state, regional, county, and private service provider level, Chapin Hall researchers are extremely familiar with the impact federal, state, local, and private funding streams have on program administration and program outcomes. Chapin Hall staff has particular expertise in working with the range of child welfare programs.

Chapin Hall's range of experience and expertise is organized around four central areas, each of which relates to the scope of services sought under this RFP: the use of administrative data to understand performance over time; conducting process studies; performing cost analyses; and, providing consultation and technical assistance.

Chapin Hall also has direct experience in working with Allegheny County DHS having served as the evaluator for their Family Group Conference initiative. Work in other agencies includes several IV-e waiver evaluations including Colorado, Ohio, and as the lead evaluator for the Tennessee Waiver evaluation in collaboration with Kempe. Much of Chapin Hall's work with public child welfare systems is done through Chapin Hall's Center for State Child Welfare Data. Among Chapin Hall's most recent accomplishments, State Data Center staff recently completed a comprehensive link between foster care and Medicaid data. The link is at the individual, claim, and placement level. The data account for \$2.6 billion worth of Medicaid claims, which are retrievable on a person, placement/facility-specific basis.

### *PCCi*

PCCi has significant experience managing information technology (I/T) projects throughout the east coast, with particular emphasis in public sector, and specifically within the Commonwealth of Pennsylvania. Our team has substantial experience deploying IBM technologies in large scale roll-outs and in managing projects both large and small.

PCCi's project management team has managed hundreds of IT implementation projects at a variety of agencies in Harrisburg, Philadelphia and throughout the remainder of the state. These projects have ranged in size from single server installations to large scale enterprise server deployments and SAN mirroring implementations.

### *Technology Capabilities*

PCCi is an IBM Business Partner that delivers customer-centric infrastructure solutions for IBM and related technologies for federal, state and local government as well as commercial and private sectors. Additionally, the PCCi team offers the following technical services skills: AIX, Linux, LPAR, TSM; System p, System x, BladeCenter, PureFlex; High Availability (HACMP,

Veritas, MSCS); Disk and Tape Storage (V7000, XIV, DS8000); Virtualization; Storage Area Networks (Brocade, McData, Cisco); Disaster Recovery and Performance Tuning.

The combined expertise of the staff from Kempe, Chapin Hall, IOA, and PCCi puts the project team in an excellent position to not only meet the requirements set forth in the RFP but to do so in a creative, high quality, efficient manner. We are very conversant with the details of social service delivery systems and experienced in working with public agency staff.

### **3) Collaborative projects on which our organizations worked.**

The project team for this proposed work has extensive experience collaborating with each other and other entities. Kempe staff have a history of seeking out such collaborations, prefer to work collaboratively, and the majority of our projects involve collaborations with our partners and our clients.

For example, in recent years, staff from the Kempe Center and Chapin Hall have collaborated on projects including the Texas Foster Care Redesign project, described above, are currently partners on a IV-E Waiver evaluation project in Tennessee, and a project examining a Predictive Risk Modeling application in New Zealand. Kempe recently partnered with Walter R. McDonald and Associates on the execution and completion of a five year cross-site evaluation under the auspices of the Quality Improvement Center for Differential Response. Finally, as indicated above, Kempe was selected to join an evaluation collaborative lead by Colorado State University to conduct the community response evaluation that will examine what happens to cases screened out from Colorado's child protective services system.

### **4) How our collaboration will manage the process of working with DHS to design and implement decision support tools and predictive analytics.**

As a beginning principle our team intends to work in close collaboration with the county staff assigned to the project. We would also propose that we coordinate project activities with a project manager/liaison as determined by DHS. At this point we anticipate working with research analysts, IT, and program staff. Our team is very experienced in working with individuals in all these roles in social services agencies. Ideally, as a collaboration we plan to work with these staff to develop a comprehensive understanding of the county's service delivery system and data warehouse resources with respect to the two service populations we intend to work with. In addition we plan to work with these staff to conduct project planning, obtain data sets and associated approvals, engage or conduct joint training where appropriate, and monitor project activities and key deliverables.

Because of the complexity of the proposed project, as a second principle communications are of crucial importance. For past projects misunderstandings have been averted by attention to working with agency staff to develop and finalize the project plan. This is coupled with routine communications during implementation including bi-weekly phone conferences where progress status is described, decisions are noted, and followed-up with written communication with the involved parties.

As a third principle, our project team is intent on developing tools that fit the needs of the county and proposing ways that decision tools can most benefit the respective county agencies. Therefore we are committed to an evidence informed approach to implementation. For this reason we think it will be important to work with the county at all stages of implementation both during the first year and after to constantly evaluate and document how the elements of the project are achieving the project goals. In addition we propose working with the county project manager to develop a county advisory committee consisting of key county staff and external advisors. This advisory group would convene at least twice during the first phase; once to review the final project plan, and to review the project evaluation. We believe this will help us to make adjustments during the implementation for the proposed work scope, but it is also needed to improve the effectiveness of new implementation processes.

Finally, based on our experience with implementation we recognize that the technology and analytics associated with decision support tools are only half the equation. It is also critical to help insure that staff are prepared to use them and have the support to do so. Attention to implementation hinges on working with county staff to identify of the organizational drivers and leverage points and to formulate strategies that account for them.

## **5) Describe experience or approach to working with an existing IT vendor to implement/integrate solutions.**

Our approach to working with the county's IT vendors is to emphasize the enhanced capacity represented by the proposed decision support tools as a value added component to the existing and planned infrastructure. It will also entail including the vendor during the planning phase of the project. As important will be to include the IT vendor(s) in the project evaluation toward the end of the first year's effort. Primarily, the goal of this process with the vendor is to assess feasibility and develop a method of integration with the technical aspects of the project and the county's IT infrastructure.

We would hope to operate in a collaborative fashion on scaling and integrating the decision support applications. Clearly there are cost and software licensing concerns involved in evaluating and planning the project. These concerns may present potential tensions during all phases, but especially during phases where the project would be brought to scale. Our intent if such tensions arise is to defer to county agency staff as the primary point of resolution.

## ***Project Description***

### **1) Project goals and objectives.**

The overall goal and proposed objectives for the project are identified below:

Project Goal: Improve the outcomes for social service populations through client classification based service delivery allocation decision support models. The concept underlying this goal and which is described in more detail below includes decision support for both workers and for general service planning and resource allocation. We propose to accomplish this goal through three phases; 1) design and proof of concept, 2) full deployment including information system

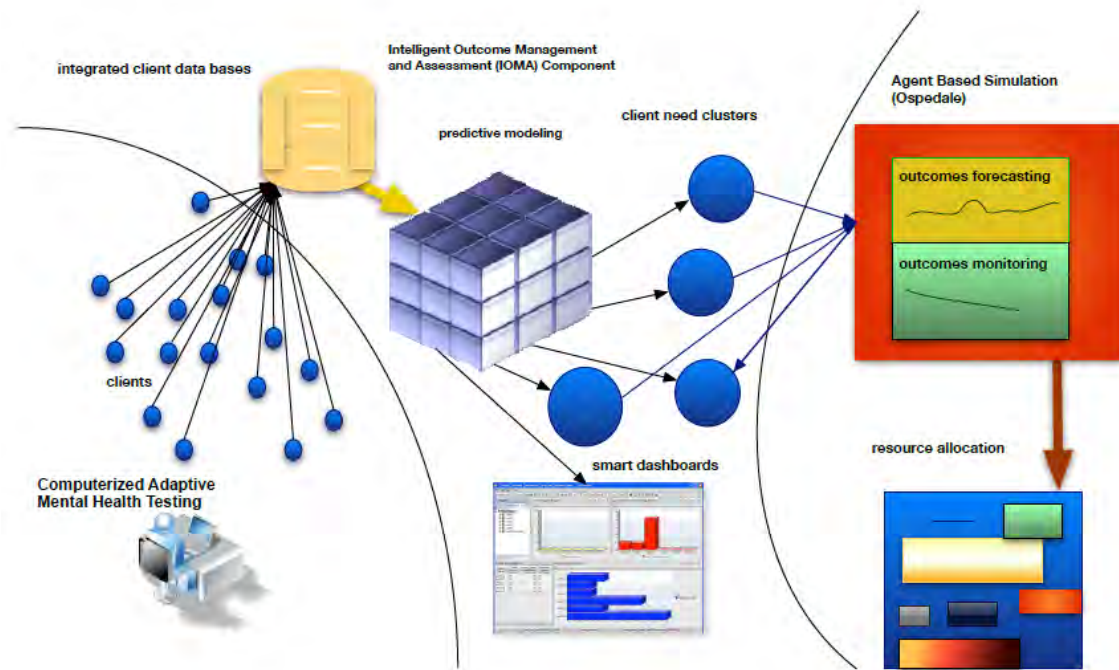
integration for one or two key social service populations, and 3) an evaluation of the project and expansion to other populations if warranted.

The project objectives are as follows:

1. Improve the availability, reliability, validity, and timeliness of assessment data for clinical and resource management,
2. Improve the turnaround and integration of assessment data into the county information system infrastructure to support worker service decision-making,
3. Use integrated linked data multiple data sources including new assessment data and predictive modeling to classify clients and/or families into needs based clusters of major social services populations,
4. Use agent based simulation techniques to forecast service needs and support resource allocation decision,
5. Use agent based simulation to anticipate and monitor service delivery system quality indicators and outcomes
6. Integrate the components of the proposed project into county's information system infrastructure, and its workforce.

The conceptual approach we propose to achieve the project goal and objectives is presented visually in Figure 1; Predictive Integrated Outcomes and Service Delivery Modeling (PIOSDM). The figure depicts an integrated framework consisting of three main decision support components: computerized adaptive testing/assessment, intelligent outcome management and assessment (predictive modeling), and agent based simulation.

### Predictive Integrated Outcomes and Service Delivery Modeling



A purpose of the project is to integrate the various products from the three tools. The concept is that data from the CAT-MH will be combined with other administrative data to support the SPSS modeler, these data in turn will help to define need clusters where the assessment and administrative data regarding service delivery for the clusters can be used to define baseline parameters for the simulation. For all of the tools a part of the project planning and evaluation process as described above will focus on how the three tools can be integrated into the current DHS IT infrastructure including COGNOS. However, for this project the team will be implementing the three components as an integrated framework for two populations as a proof of concept.

Computerized Adaptive Test-Mental Health or CAT-MH is an information technology supported assessment and service decision support tool we propose to use with adolescents that is based on obtaining self-report data directly from the service population. The service participant interacts directly with the input device (computer, tablet, smart phone, etc.) and is prompted to respond to questions. The input device can be configured to allow the participant privacy while completing the assessment including aural questioning (via headset) in a language of choice.

Examples of possible use by case management staff include weekly monitoring of depressive severity following a prescription of an antidepressant to insure that the treatment is functioning as intended. It should be obvious that the implementation of the CAT-MH is almost as important as its scientific foundation. A major advantage of CAT in this regard is that the starting value for

the next session can be informed by the score on the previous session leading to further reduction in patient and staff burden.

The assessment results are available to the case manager, but in the PIOSDM framework it can be integrated with other data into the county's database for the population. An advantage of the CAT-MH is that it supports both case management and Intelligent Outcome Management and Assessment (IOMA) processing and because it is a self-assessment potentially the agency workload burden associated with obtaining assessment data completed by staff.

Intelligent Outcome Management and Assessment (IOMA) has at its core the IBM SPSS Modeler suite of predictive analytic tools. The SPSS Modeler is capable of obtaining integrated data inputs from extant information systems and data bases including Oracle.

The SPSS Modeler software will be used to develop subpopulations of clusters defined by key characteristics that are statistically distinct; client needs clusters. These clusters are organized on the basis of characteristics drawn from the available integrated data. Assuming the success of the analytic process, these clusters will be used as the basis for the agent based simulation parameters.

The Agent Based Simulation (Ospedale) is a forecasting tool developed through a collaboration of the Chapin Hall Center for Children, Argon Laboratories, with input from Kempe faculty. The purpose of the model is to simulate a service delivery system. When properly parameterized the model produces forecasts of service utilization and outcomes. The underlying simulation architecture is based on statistical representations of individual agents (workers, supervisors, managers, etc.) who reach decisions about individual service participants. These decisions form a probabilistic state space and drive the dynamics of the service delivery system. Ideally the agent level decision making probabilities are based on parameters obtained from an analysis of the data derived initially from the actual service delivery system, in the case of the PIOSDM project these parameters will be derived from the identification of client clusters and an analysis of an historical baseline of service delivery utilization data specific for each needs cluster. Outputs of the process include service delivery system entries, service volumes, and service transitions (e.g., transitions to less or more restrictive settings), and system exits. The model is designed to account for different assumptions about the underlying economics of the service delivery system including both demand and supply based theory.

Once simulation is parameterized and tuned to correspond to actual baseline performance, simulation outputs will be presented to suggest how the resources can be reallocated. This is an interactive process conducted by modelers and program management and involves developing use scenarios that are then tested to gauge forecasted performance, identify missing data or analyses, and support decisions about the reallocation of resources. Finally, the model is used to evaluate the performance of the system against the forecasted baselines.

## **2) Detailed Description of the Services and Consultation to be Provided**

### *Overview*

The service proposed here is to develop a design and proof of concept during the first year of funding. Upon achieving a successful proof of concept our collaborative is prepared to work with DHS to fully integrate and scale the modeling approach into the county's information system infrastructure. Our proposed plans for the first year are described below in detail and plans for possible renewal are described more broadly.

### *Conceptual Approach*

As described above the conceptual approach we propose is based on adapting and evaluating three decision support technologies: 1) computerized adaptive testing/assessment, 2) intelligent outcome management and assessment (predictive modeling), 3) and agent based simulation. Each of these technologies constitute relatively advanced IT and analytic tools which in and of themselves would have value in the decision support context of the county. Taken together our team believes that these technologies will constitute a major advance in decision support for social services, and could serve as a model for other populations and other jurisdictions. Our team is prepared to offer services that will implement the technology, while at the same time working collaboratively with the DHS staff in all aspects of the project.

### *Target Populations*

For this project we are planning on a design and implementation for two key populations; adolescents in the foster care system, and elderly with mental health risks. There are several reasons for focusing on these populations for the design and proof of concept. First, our project team is very familiar with these populations and their service delivery milieus. Given the short time frame for the initial project activity, this will allow our team to be at its most productive and take advantage of this knowledge rapidly to assess the existing data resources, develop predictive analytics based on knowledge about the populations and their underlying risks, and being in a position evaluate and adjust the implementation based on our experiences with similar projects.

Second, aspects of the existing versions of the technology (particularly the CAT-MH and agent based simulation) have already been developed with these populations in mind. This means that our team know what staff in addition to the IT and research personnel at DHS need to be engaged in the implementation and how to carry out work with those audiences in mind. Finally, the populations are of a modest and manageable size, but still large enough to be appropriate groups for the use of probability based tools.

### *Adolescents in Foster Care*

This population presents considerable challenges for most child welfare agencies. Typically compared to younger children in care, adolescents are more difficult to reunify with birth parents, more difficult to adopt, and may not be well prepared to leave foster care as they age out. Often these are children who experience the longest stays in care, and as the two conditions are related, larger number of placements while in care. Such children are often diagnosed with mental health needs and their use of related medications is often greater as well. Finally, they are exposed to and may participate in various high-risk behaviors such as abuse of substances.

### *Elderly Who are Psychiatrically Hospitalized or at High Risk of Hospitalization*

This population we intend to focus on among the elderly represents the high risk group with mental health needs who are psychiatrically hospitalized or at risk of hospitalization. Given these conditions the development of low workload impact tools as described to assist in diagnosing elderly with mental health needs and monitoring their progress have definite potential for improving effective service delivery.

Being able to more clearly differentiate members of key high cost high risk populations with varying needs through predicative modeling has important implications for defining the appropriate range of evidence based clinical services, estimating the potential volume of needs, and allocating resources more optimally based on these needs.

### **Consultation Activities**

The activities of the project consist of a planning and evaluation activity and the consultation for the three decision support tools. These activities are a design and proof of concept and are intended to take place over no more than one year.

### *Phase One Plan and Evaluation*

During the planning and evaluation activity the proposed work scope will address the development of more detailed identification of the project activities and schedule. Included in these areas are startup activities, identification of participating county staff and other stakeholders, communications and logistics, advisory groups, project ethics, software licensing and installation, training, testing participants and schedules, and other tasks related to the management and support of the project. Kempe Center staff will largely be responsible for this aspect of the project.

Task areas for the project planning activity include assessing the current data resources available to the department. This includes understanding the cross agency availability of linked data and the specifications of the individual databases that are associated with the focus populations.

It will also be necessary to develop an understanding of the current IT infrastructure, particularly regarding capacity and resources of the county data warehouse, hardware, networking, server capacity, and what software is available. We are aware that tools such as COGNOS and SPSS are in use and of course these are directly with the tools we are proposing. Equally important is to identify appropriate staff within DHS who are able to work with our team to process data, provide linkages to data resources, and to address any concerns about data ethics and security concerns. In other projects, our team has worked with a variety of encrypted data exchange protocols including direct access via VPN. We are prepared to work through the options and develop methods for data exchange that meet the requirements of the county. Once the final project plan is drafted we would propose presenting it to a project advisory group for further input and feedback before it is finalized.

This activity area also includes evaluation of the project with the county staff in the final months of the first year to assess whether the proof of concept is sufficiently robust and if it is feasible to implement on a full scale basis. This is also a point to determine whether other populations



served by the DHS might benefit as well. As our team envisions it the project evaluation would hinge on the following questions:

1. Was it possible to introduce the three project components into DHS?
2. Were the appropriate program/clinical staff able to use the CAT-MH?
3. Was the project team able to develop robust needs clusters for the focus populations using IOMA?
4. Was the team able to develop and test appropriate resource allocation models for the focus populations using agent based modeling?
5. What IT infrastructure changes would facilitate scaled implementation?
6. Is scaled implementation feasible, and if so for which populations?

#### *Computerized Adaptive Testing/Assessment*

The consultation for this aspect of the project would be carried out primarily under auspices of Chapin Hall and supported by our consultant Robert Gibbons who is the author of the CAT-MH, and with some coordination by Kempe staff. As described above the CAT-MH is designed to be used directly by the client, in this case adolescents in or newly entering the foster care system, or elderly clients at risk of psychiatric hospitalization. Because the CAT-MH is immediately available for use with internet capable computing much of the activity will focus on implementing the assessment process in the DHS context. The consultation for this activity area will include the following:

1. Determining physical settings can be used for proof of concept testing where participants can interact with the CAT-MH and setting up the CAT-MH in.
2. Arrange for any additional hardware and hardware configurations needed to set up the CAT-MH through PCCi (e.g., headphones with microphones, tablet computers, etc.) in the assessment settings<sup>3</sup>.
3. Training for involved county staff to work with participants.
4. Developing and implementing the assessment protocols including consents and approvals, assessment scheduling, post assessment, and follow-up.
5. Training involved staff to interpret the CAT-MH results
6. Integrating the assessment results with the DHS participant databases.
7. Monitoring the implementation to assess levels of participation, error reporting, and other data quality concerns.
8. Review of predictive analytic results (see below).

Finally, the project team will make recommendations regarding bringing the computerized adaptive assessment to scale as part of the overall recommendations for the project going forward.

#### *Predictive Modeling for Classification*

The predictive modeling work of IOA team will be responsible for implementing a repeatable predictive modeling process, and will be the lead predictive model developer. In the first phase of work IOA will lead the predictive analytic model development and testing for the foster care and elderly populations. In collaboration with Kempe, IOA will clean, structure, pre-process, and

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<sup>3</sup> Note: a limited budget is available for these items.

model the available data. In addition, IOA will engage DHS staff and administrators in a qualitative process using focus groups to vet and analyze the models and rule sets that have been developed.

The IOA team will additionally collaborate in all phases of the project to ensure that the predictive analytic models are connected to DHS dashboards and assessment tools as seamlessly and elegantly as possible. PCCi will provide and oversee installation of the IBM SPSS Modeler as the authorized IBM vendor for the software.

#### *Agent Based Simulation and Resource Allocation*

As described above the agent based simulation model component of the project is oriented to improving program resource definition and allocation. This part of the project is based on the Ospedale modeling environment originally designed to understand service delivery for children in group or residential care (see description below and attachment) and will largely be carried out by staff from Chapin Hall with assistance from Kempe Center staff. We propose adapting the model to address the foster care population including those in residential care. Services for the agent based model are divided between three main activities; 1) obtaining data to develop basic service delivery models, 2) tuning the model against baselines, 3) incorporating sub-populations of needs based clusters derived from the predictive modeling, and 4) development of the resource allocation dashboard.

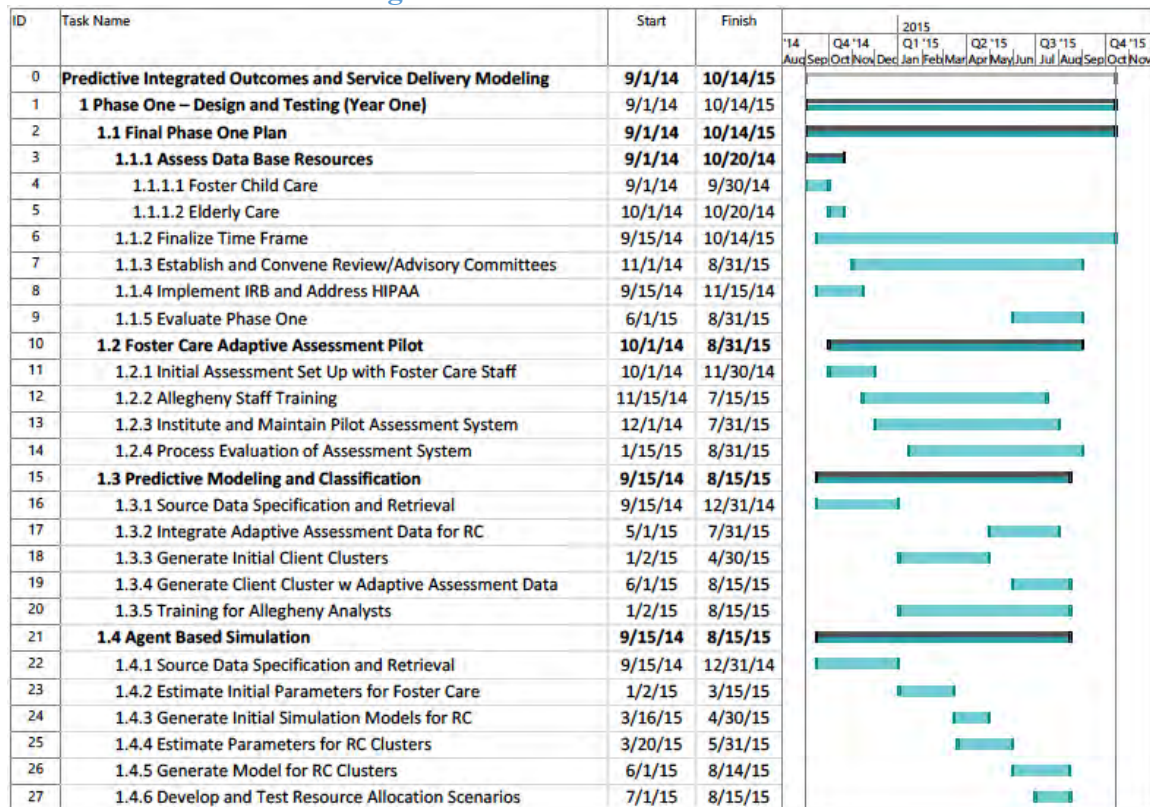
### **3) How the program will be integrated with other information technology and tools.**

The tools proposed for use in the project can all be integrated into the DHS IT infrastructure. For example, the CAT-MH is internet based using conventional browser technology. Products from the CAT-MH process can be uploaded into the appropriate client records with appropriate support from county IT analyst staff. As described above the IBM SPSS modeler is designed to be compatible with standard data base architecture. SPSS Modeler uses a client/server architecture, allowing resource-intensive operations to be executed on a server, and will readily support application in COGNOS which is already in use by DHS and maintained by Deloitte and Touché. The current version of Ospedale was designed to work with Windows.

### **4) Timeline for design and development**

The general activities described above are shown in Figure 2 as a Gantt chart showing the overall time frames for activities during the first year of the PIOSDM project.

**Figure 1 Phase One Tasks and Timeline**



If the proof of concept is successful and some or all aspects deemed appropriate for scaling, our team proposes conducting the following broadly oriented tasks in years two and three:

Overview Tasks for Years 2 and 3
Phase Two – Deployment and Integration (Year Two – Three)
Integrate Project Components Into IT Infrastructure
Provide ongoing Training
Refine/Refresh Predictive Models
Foster Care
Elders with Mental Health Needs
Refine Simulation Models
Foster Care
Elders with Mental Health Needs
Phase Three – Modeling Evaluation and Next Steps (Year Two & Three)
Assess Applicability to Other Populations
Pilot Implementation
Monitoring and Effectiveness
Support Ongoing Integration for Other Populations

## **5) Examples of tools/systems already developed.**

### *Computerized Adaptive Test/assessment (CAT-MH)*

The CAT-MH, is currently a collection of three adaptive tests for depression, anxiety, and mania, and a diagnostic screening test for major depressive disorder (CAD-MDD) developed as part of a 5-year grant from the National Institute of Mental Health. The CAD-MDD produces a screening diagnosis of depression and a corresponding confidence level associated with that diagnosis. A more detailed description of its development, operation, and evaluation are found in the attachments to this proposal.

The ultimate goal of the CAT-MH is to make diagnostic screening of mental disorders such as depression and long term monitoring of the severity of those disorders as seamless as possible, decreasing patient and clinician burden to near zero levels. The CAT-MH will be distributed as a cloud-computing system where a secure and HIPAA compliant internet system is used to assess individuals anytime from anywhere on any internet-capable device. For example, the cloud will permit an individual in urban Chicago, the most remote corner of the Navajo Nation or rural West Virginia to log on 24x7x365 via an internet browser with a mobile computing device, a laptop or a desktop to a secure website with a unique ID and password and carry out the assessment. The results of that assessment and automated suicide warnings can be directly transmitted to any number of reviewers in near real time and can be placed directly into the participants data file.

### *IBM SPSS Modeler*

IBM SPSS® Modeler Professional is a data mining workbench used to analyze structured data to create predictive intelligence. SPSS Modeler Professional is popular with analysts and business users alike. Its automated data preparation and modeling features enable non-analysts to produce accurate models quickly and easily without specialized skills. Professional analysts can also take advantage of the software's advanced data preparation and predictive modeling capabilities to create the most sophisticated of streams. The intuitive graphical interface of SPSS Modeler makes it easy for users to visualize every step of the data mining process as part of a "stream." By interacting with these streams, analysts and business users can collaborate – adding business knowledge and domain expertise to the data mining process. It allows them to focus on discovering insights rather than on technical tasks like writing code. They can also pursue "train-of-thought" analysis, explore the data more deeply; uncovering additional relationships that make sense to the organization.

From this visual interface, one can easily access and integrate data in virtually any type of database, spreadsheet or flat file, including IBM SPSS Statistics, IBM SPSS Data Collection, Cognos Business Intelligence, SAS and Microsoft Excel files. When combined with SPSS Modeler Professional Server, there is no need to move data from large databases, since the analytics and mining take place in-database. The result is a significant improvement in analytical performance.

### *Agent Based Simulation (Ospedale)*

Ospedale, an agent based simulation model, was originally formulated to address service delivery questions and simulate the aggregate experiences of children in group or residential

care. Chapin Hall developed Ospedale to utilize data derived from administrative data sets to parameterize the agent based simulation environment specific to the target agency. The model can be adjusted by making different assumptions about these parameters, for example foster care entry and exit rates. In addition the model can be tuned to operate with subpopulations and those can be simulated as subpopulations or in the aggregate with other subpopulations. There are three distinct *categories* of dynamic simulation models that are now built and operate in the Ospedale modeling environment.

1. Models of decisions to admit children in need of care to one of the care path alternatives, based upon historical data and corresponding statistical models of admissions.
2. Models of changes in licensed system capacity (i.e., number of beds) of facilities due to endogenous and exogenous factors, again based on historical data and statistical models.
3. Models of clinical outcomes, including duration of stay, as a function of individual patient characteristics, demographics, family background, medical history, etc., and the profile of care that the child was given.

The attached exhibits for each of the components provide more detailed summaries of the three already developed tools.

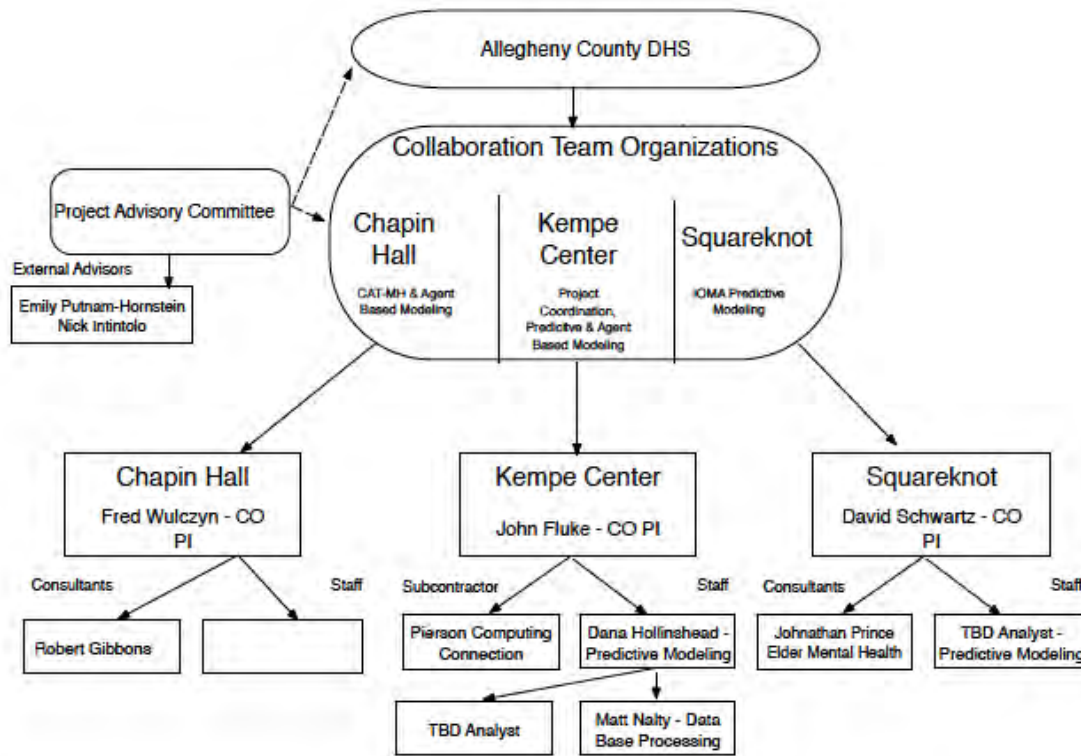
## **6) Staffing plan: Staff roles and qualifications.**

### *Overview of Project Staffing*

The proposed project team includes professionals with considerable experience in developing and implementing decision support tools and in conducting research in the area of social services delivery and management. Many members of the team have worked for decades assisting social services agencies in developing their programs, implementing decision support tools, program evaluation, data collection, administrative data construction, and data analysis.

The team consists of staff and faculty from two university based organizations who are the primary collaborators on the proposed project: The Kempe Center for the Prevention of Child Abuse at the University of Colorado School of Medicine, and Chapin Hall at the University of Chicago and IOA will be form the management team for the project. Kempe will act as the single point of contact and coordinate services. In addition the project will include some key consultants who bring considerable expertise in CAT-MH and knowledge of elder services. The project organizational chart is show in Figure 3.

**Figure 2 Project Organizational Chart**



## Project Roles

### *Kempe Center*

**John Fluke, Ph.D.** is Associate Director of System Research and Evaluation at Kempe. For this project Dr. Fluke will carry out the role of collaboration team lead and project CO-PI for Kempe. Dr. Fluke's work focuses on social service delivery system research in child welfare and mental health services for children. Dr. Fluke is internationally recognized as a researcher specializing in assessing and analyzing decision-making in human services delivery systems. Dr. Fluke also works on national child maltreatment data collection systems and analysis. Dr. Fluke is known for his innovative and informative research in the areas of child maltreatment prevalence, child welfare administrative data analysis, workload and costing, and performance and outcome measurement for children and family services.

**Dana Hollinshead, Ph.D.** is an assistant professor with Kempe and has over twenty years of experience conducting research, policy analysis, and program evaluation in the field of child welfare. Dr. Hollinshead will take the role of lead project analyst and support predictive modeling for the child welfare populations. Dr. Hollinshead's areas of expertise include re-reporting and recurrence of child maltreatment, differential response, performance measurement, system reform, and the influence of policies, practices, and demographics on child welfare decision-making and agency outcome measures.

**Matthew Nalty** is an information specialist at Kempe and will serve as the project Database Analyst. In that role he will consult with senior leadership, subject matter experts, and partnering organizations to develop information lifecycle management strategies, data sharing strategies, and analytical or reporting needs. Coordinate planning for the automation needed for standard reporting that includes test plans and support processes. Document baseline business processes, systems, information, and technologies. Perform research to formulate data governance recommendations (data ownership; management; usage rights; and decision making processes, procedures, and mechanisms). Contribute to the development of data management strategies, policies and best practices through participation in management meetings and other direct contributions.

#### *Chapin Hall*

**Fred H. Wulczyn, Ph.D.** is a Senior Research Fellow at Chapin Hall. For this project he will be the project CO-PI and lend his expertise and experience in agent based modeling. He is the 2005 recipient of the National Association of Public Child Welfare Administrators' (NAPCWA) Peter Forsythe Award for leadership in public child welfare. In 2011, he was honored with the Flynn Prize, an award given to a researcher whose work has had a demonstrable impact on vulnerable populations. Among his responsibilities at Chapin Hall, Dr. Wulczyn is director of the Center for State Child Welfare Data, a collaboration of Chapin Hall, the American Public Human Services Association, and other research partners. Dr. Wulczyn has designed two major social experiments: the Child Assistance Program and the HomeRebuilders project. The Child Assistance Program was awarded the Innovations in Government Award from Harvard University and the Ford Foundation. Dr. Wulczyn earned his Ph.D. at the University of Chicago.

**Robert Gibbons, Ph.D.** is the developer of CAT-MH and will serve as our consultant for this aspect of the project. Dr. Gibbons is a Professor in the Departments of Medicine & Health Studies at the University of Chicago. Among his many research interest is item response theory and computerized adaptive testing, the basis for CAT-MH. He will work closely with Chapin Hall to implement the CAT-MH and provide ongoing input into the use of CAT-MH in the development of the needs based clusters.

#### *IOA*

**David Schwartz** – David R. Schwartz, MSW is Chief Executive Officer at Intelligent Outcome Assessment (IOA), and is the predictive analytic modeling team lead and project CO-PI for IOA. Schwartz's work focuses on rigorously building, testing, and deploying predictive analytic models in database or through analytic servers using social service data warehouses. Schwartz is one of the first researchers to train and test predictive analytic modeling algorithms in collaboration with interdisciplinary researchers using child welfare, juvenile recidivism, and foundation program evaluation data (e.g., Schwartz, Kaufman, Schwartz, 2004; Schwartz, Jones, Schwartz, & Obradovic, 2008), and served as data modeling lead for several cutting edge evaluation and predictive analytics research projects to better understand the pathways to successful program outcomes for youth, families, volunteers, and the elderly (e.g., Gap Foundation, Thrive Foundation for Youth, Tufts University Health Plan Foundation, Target, Feeding America, Encore Senior Centers, Girl Scouts, and New York State Office of Children and Family Services). Schwartz was a case manager for the Choice Program, an alternative to secure detention program with a significant number of crossover youth.

CO – PI and Lead Predictive Modeler

**Jonathan Prince, Ph.D.** – Prince will collaborate with the team on mapping DHS decision points, assessing the available integrated data for modeling, and providing frequent consultation during all phases of model development and deployment.

Dr. Prince will also help scope and articulating the practice implications for decision support tools for the elderly (primary role) and youth in foster care (secondary role).

*PCCi*

**Debra Pierson, PMP**, will serve as Project Executive for this project, providing project oversight and manage contractual matters. Deb Pierson has more than twenty five years experience providing deployment services to the Commonwealth. Deb performed as project manager for the installation of more than 10,000 PCs for the County Assistance Offices for the PA Department of Welfare, and provided oversight for the installation of 31,000 laptops for the Classrooms for the Future project. In addition, Deb supported the PCCi project management team for the Detroit Public Schools 40,000 netbook installation project.

**Janese Shenk** will serve as the primary PCCi contact for the project and support the IBM SPSS Modeler software. Janese has more than ten years of experience providing project management and technical services to the Commonwealth of Pennsylvania, including management of similar rollout projects. Janese managed the installation of over 20,000 laptops and 2000 interactive whiteboards in more than 60 school districts in Central Pennsylvania over fourteen weeks as part of Year 2 of the Department of Education’s Classrooms for the Future project. PCCi had up to five installation teams performing simultaneously under Janese’s direction during this project.

*Project Advisors*

**Nick Intintolo**, IBM’s National Industry Specialist for Social Services/Criminal Justice will serve in a non-billing oversight role to advise the project team, and when available, participate in customer meetings. Intintolo spearheaded the IBM Intelligent Outcome Management and Assessment (IOMA) Framework, while orchestrating a collaboration of thought leaders and scholars from across public sector industry sectors, to bridge the gap between best-in-class technology manufacturing, and world class domain expertise. He has spent over twenty years advising U.S. Government leaders adopt state-of-the-art technology solutions in the social services, criminal justice, and public safety domains, most notably an original contributor to the PA-JNET architecture.

**Emily Putnam-Hornstein** joined the faculty of the University of Southern California in 2011 after completing her doctoral studies at the University of California, Berkeley. With an interest in child maltreatment, public child welfare systems, and extensive experience in administrative data analysis, Putnam-Hornstein’s current research focuses on the application of epidemiological methods to improve the surveillance of non-fatal and fatal child abuse and neglect. Analysis of this repository has generated knowledge as to where scarce child welfare resources may be most effectively targeted and advances an understanding of maltreated children within a broader, population-level context.



## References

Matt Davis, PhD, Director, Utah Title IVE Evaluation, Social Research Institute, College of Social Work, University of Utah, 395 South 1500 East #111, Salt Lake City, UT 84112 Phone: 801-948-3112 Email: <a href="mailto:matt.davis@socwk.utah.edu">matt.davis@socwk.utah.edu</a>	Moira Wilson, Knowledge and Insights, New Zealand Ministry of Social Development, Bowen State Building Level 1, Bowen Street, P O Box 1556, Wellington 6140, New Zealand Phone: 64 4 916 3581 Email: <a href="mailto:moira.wilson001@msd.govt.nz">moira.wilson001@msd.govt.nz</a>	Bonnie Hommrich Deputy Commissioner Tennessee Department of Children's Services Kordell Hull Building, 7th Floor 436 6th Ave North Nashville, Tn. 37243 Phone: 615-532-3591 Email: <a href="mailto:Bonnie.Hommrich@tn.gov">Bonnie.Hommrich@tn.gov</a>
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### 3. BUDGET AND BUDGET DESCRIPTION

The budget for the project consists of personnel costs, travel, subcontractors, software, and indirect costs as follows:

**Personnel Costs** – Personnel costs for Kempe are based on an hourly rate that reflects salary and benefits.

**Travel Costs** – Travel reflects estimated coach round trip coach airfare, hotel, and per diem estimated on the basis of trips with 3 or 4 day overnights. This includes travel for project personnel to Pittsburg, Pennsylvania from Denver, Colorado; Chicago, Illinois; and Philadelphia, Pennsylvania.

**Subcontracts** – The subcontract line items reflect the total personnel related costs (salary and benefits), consultants (Dr. Gibbons at Chapin Hall, and Dr. Prince with IOA), travel, and indirect costs for Chapin Hall and Intelligent Outcomes Analytics (IOA). This includes travel for project personnel to Pittsburg, Pennsylvania from Chicago, Illinois (\$4,000 for Chapin Hall); and Philadelphia, Pennsylvania (\$8,400 for IOA).

**Other Costs** – Under other costs is the quote for IBM SPSS Modeler software to be supplied by our MWBE firm PCCi who is also a qualified IBM vendor. The quote reflects the cost for three production licenses, two to be used by the project team, and one to be used by Allegheny DHS. It also includes the cost of a 140 user IBM SPSS Modeler non-production license for the DHS. The licenses will be invoiced directly to Allegheny DHS by PCCi. The cost of these licenses can potentially be reduced if the county can work with IBM to participate in its government discounting program.

**Indirect** – The University's indirect cost rate on contracts through auxiliary accounts is 10% and encompasses Departmental/organization administration costs each contract should bear.

The summary budget appears below:

## PREDICTIVE INTEGRATED OUTCOMES AND SERVICE DELIVERY MODELING

Decision Support Tools and Predictive Analytics in Human Services Kempe Center Bid 25

#### **4. ATTACHMENTS**

##### **Required Forms**

Appendix B – Abbreviated Application  
Appendix C – Internal Revenue Service W-9  
Appendix D – Supplier/Remit to Information  
M/W/DBE Participation Form  
Pierson Computing WBE Reverification

##### **Resumes**

*The Kempe Center for the Prevention and Treatment of Child Abuse and Neglect*

John D. Fluke

Dana M. Hollinshead

Matthew J. Nalty

*Chapin Hall at the University of Chicago*

Fred H. Wulczyn

Robert Gibbons

*Intelligent Outcome Analytics, LLC*

David R. Schwartz

Jonathan D. Prince

##### **Tool Descriptions**

Overview of Computerized Adaptive Mental Health Testing

IOMA - Intelligent Outcome Management and Assessment

IBM SPSS Modeler Professional

IBM SPSS Modeler Server performance and optimization

Agent-Based Social Simulation in the Service of Child Welfare Issues: Defining the Demand for Group and Residential Care

##### **Letters of Commitment**

Chapin Hall

Intelligent Outcome Analytics, LLC

Pierson Computing Connection, Inc.

***Required Forms***

Appendix B – Abbreviated Application

Appendix C – Internal Revenue Service W-9

Appendix D – Supplier/Remit to Information

M/W/DBE Participation Form

Pierson Computing WBE Reverification

APPENDIX B  
ABBREVIATED APPLICATION

1. Primary Contacts

	Chief Executive	Chief Information Officer	Chief Financial Officer	Contract Processing Contact
Name	Lilly Marks	Russ Poole	Jeff Parker	Rob Murchison
Email	Lilly.Marks@ucdenver.edu	Russell.Poole@ucdenver.edu	Jeff.Parker@ucdenver.edu	Robert.Murchison@childrenscolorado.org
Phone	303.724.5369	303.724.0425	303.724.2750	303.864.5365

Note: If you are an individual applying, you may identify yourself for all of the above roles.

2. I/we certify that this I/we/this organization is not currently under suspension or debarment by the Commonwealth of Pennsylvania, any other state, county or the federal government.

☒ So certified

3. Have you ever obtained or been denied a performance or fidelity bond, or has your bond ever been revoked?

☐ Yes ☒ No

If yes, explain:

4. Has an application to be an Allegheny County provider/vendor been denied in the past?

☐ Yes ☒ No

If yes, explain:

5. Have you ever filed for bankruptcy?

☐ Yes ☒ No

If yes, explain:

6. Have your paid all taxes for the past years, including but not limited to real estate tax, employer taxes, employee withheld taxes, personal income tax (if individual)?

☒ Yes ☐ No

If yes, explain: The University of Colorado is a State agency.

7. Do you have the capability to do electronic billing if required?

☒ Yes ☐ No

If yes, explain: Ability to invoice electronically and receive electronic payments, though checks are preferred.

8. Do you currently carry the insurance (see contract on DHS website) required to enter into a contract with DHS?

☒ Yes ☐ No

If yes, explain: The University of Colorado is self-insured

9. Do you/your staff have valid Pennsylvania driver licenses?

☐ Yes ☒ No

If yes, explain:

As an authorized signatory for Regents of the University of Colorado I hereby certify to the best of my knowledge and belief that the information in this proposal and application is true and accurate.

Signature: Shaun P. McMullin Date: 4/17/14

Print/Type Name: Shaun McMullin Title: Deputy Controller



**APPENDIX C INTERNAL REVENUE SERVICE W-9**  
A fill-in version of this form can be obtained at the IRS website.

<b>Form W-9</b> (Rev. October 2007) Department of the Treasury Internal Revenue Service	<b>Request for Taxpayer Identification Number and Certification</b>	Give form to the requester. Do not send to the IRS.
Print or type See Specific Instructions on page 2.	Name (as shown on your income tax return) <b>Regents of the University of Colorado</b>	
	Business name, if different from above <b>The Kempe Center</b>	
	Check appropriate box: <input type="checkbox"/> Individual/Sole proprietor <input type="checkbox"/> Corporation <input type="checkbox"/> Partnership <input type="checkbox"/> Limited liability company. Enter the tax classification (D=disregarded entity, C=corporation, P=partnership) ▶ ..... <input checked="" type="checkbox"/> Exempt payee <input checked="" type="checkbox"/> Other (see instructions) ▶ <b>State Institution of Higher Education</b>	
	Address (number, street, and apt. or suite no.) <b>13123 E. 16th Ave B390</b>	
	City, state, and ZIP code <b>Aurora, CO 80045</b>	
List account number(s) here (optional)		Requester's name and address (optional)
<b>Part I Taxpayer Identification Number (TIN)</b>		
Enter your TIN in the appropriate box. The TIN provided must match the name given on Line 1 to avoid backup withholding. For individuals, this is your social security number (SSN). However, for a resident alien, sole proprietor, or disregarded entity, see the Part I instructions on page 3. For other entities, it is your employer identification number (EIN). If you do not have a number, see <i>How to get a TIN</i> on page 3. <b>Note.</b> If the account is in more than one name, see the chart on page 4 for guidelines on whose number to enter.		
<b>Part II Certification</b>		
Under penalties of perjury, I certify that:		
<ol style="list-style-type: none"><li>The number shown on this form is my correct taxpayer identification number (or I am waiting for a number to be issued to me), and</li><li>I am not subject to backup withholding because: (a) I am exempt from backup withholding, or (b) I have not been notified by the Internal Revenue Service (IRS) that I am subject to backup withholding as a result of a failure to report all interest or dividends, or (c) the IRS has notified me that I am no longer subject to backup withholding, and</li><li>I am a U.S. citizen or other U.S. person (defined below).</li></ol>		
<b>Certification instructions.</b> You must cross out item 2 above if you have been notified by the IRS that you are currently subject to backup withholding because you have failed to report all interest and dividends on your tax return. For real estate transactions, item 2 does not apply. For mortgage interest paid, acquisition or abandonment of secured property, cancellation of debt, contributions to an individual retirement arrangement (IRA), and generally, payments other than interest and dividends, you are not required to sign the Certification, but you must provide your correct TIN. See the instructions on page 4.		
<b>Sign Here</b>	Signature of U.S. person ▶ <i>Shaun P. McMullin</i>	Date ▶ <i>4/12/14</i>
<b>General Instructions</b>		
Section references are to the Internal Revenue Code unless otherwise noted.		
<b>Purpose of Form</b>		
A person who is required to file an information return with the IRS must obtain your correct taxpayer identification number (TIN) to report, for example, income paid to you, real estate transactions, mortgage interest you paid, acquisition or abandonment of secured property, cancellation of debt, or contributions you made to an IRA.		
Use Form W-9 only if you are a U.S. person (including a resident alien), to provide your correct TIN to the person requesting it (the requester) and, when applicable, to:		
<ol style="list-style-type: none"><li>Certify that the TIN you are giving is correct (or you are waiting for a number to be issued),</li><li>Certify that you are not subject to backup withholding, or</li><li>Claim exemption from backup withholding if you are a U.S. exempt payee. If applicable, you are also certifying that as a U.S. person, your allocable share of any partnership income from a U.S. trade or business is not subject to the withholding tax on foreign partners' share of effectively connected income.</li></ol>		
<b>Note.</b> If a requester gives you a form other than Form W-9 to request your TIN, you must use the requester's form if it is substantially similar to this Form W-9.		
<b>Definition of a U.S. person.</b> For federal tax purposes, you are considered a U.S. person if you are: <ul style="list-style-type: none"><li>An individual who is a U.S. citizen or U.S. resident alien,</li><li>A partnership, corporation, company, or association created or organized in the United States or under the laws of the United States,</li><li>An estate (other than a foreign estate), or</li><li>A domestic trust (as defined in Regulations section 301.7701-7).</li></ul>		
<b>Special rules for partnerships.</b> Partnerships that conduct a trade or business in the United States are generally required to pay a withholding tax on any foreign partners' share of income from such business. Further, in certain cases where a Form W-9 has not been received, a partnership is required to presume that a partner is a foreign person, and pay the withholding tax. Therefore, if you are a U.S. person that is a partner in a partnership conducting a trade or business in the United States, provide Form W-9 to the partnership to establish your U.S. status and avoid withholding on your share of partnership income.		
The person who gives Form W-9 to the partnership for purposes of establishing its U.S. status and avoiding withholding on its allocable share of net income from the partnership conducting a trade or business in the United States is in the following cases:		
<ul style="list-style-type: none"><li>The U.S. owner of a disregarded entity and not the entity,</li></ul>		

## APPENDIX D

### Industry Classification by NAICS Code

Primary Industry \_\_\_\_\_

Secondary Industry (if applicable) \_\_\_\_\_

\*If code is not known go to <http://www.census.gov/epcd/naics02/naicod02.htm> and select the correct code.

### ~~Supplier Information (Search Type "P") – (Where PO should be sent to place order)~~

~~Please type or print~~

~~Company Name \_\_\_\_\_ Telephone Number \_\_\_\_\_~~

~~Address Line 1 \_\_\_\_\_ Fax Number \_\_\_\_\_~~

~~Address Line 2 \_\_\_\_\_~~

~~Address Line 3 \_\_\_\_\_~~

~~City \_\_\_\_\_ State \_\_\_\_\_~~

~~ZIP Code \_\_\_\_\_~~

### Required Information

Supplier/Remit To Information (Search Type "V") – (Where check will be mailed for payment. Check must be made payable to exact name listed under TIN provided or check cannot be processed.)

**Please print or type**

Supplier/Payee Name \_\_\_\_\_  
Regents of the University of Colorado

Address Line 1 \_\_\_\_\_  
The Kempe Center

Address Line 2 \_\_\_\_\_  
13123 E 16th Ave B390

Address Line 3 \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_  
Aurora CO

ZIP Code \_\_\_\_\_  
80045

Telephone Number \_\_\_\_\_  
303-864-5338

Fax Number \_\_\_\_\_  
303-864-5367

\*If the "remit to" information provided on form does not match invoices submitted for payment, the Controller's Office MUST contact supplier to verify address information before payments are processed. Thank you for your cooperation.



## APPENDIX D

If the Allegheny County Department with which you do business is known, providing the information below will help in the processing of your payments. Failure to include the information may result in processing delays.

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### Allegheny County

#### Departmental Contact

Name	Leslie Lewis-Pollard
Telephone No.	412-350-5663
Fax No.	412-350-3414
EMail Address:	Lewis-pollard@alleghenycounty.us

#### Supplier/Payee Contact Name

Name	Lorena Hendrix
Telephone No.	303-864-5338
Fax No.	303-864-5367
Email Address:	lorena.hendrix@childrenscolorado.org

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# COUNTY OF ALLEGHENY

## M/W/DBE PARTICIPATION STATEMENT

Failure to complete this form and submit it with your contract may cause delays in processing

### SOLICITATION AND COMMITMENT

MINORITY, WOMEN AND DISADVANTAGED BUSINESS ENTERPRISES

FISCAL YEAR/PERIOD	NAME OF PROVIDER	ADDRESS	PHONE NUMBER
2014	Regents of University of Colorado	13123 East 16th Avenue, B390 Aurora, CO 80045	303-864-5219

List below ALL M/W/DBE's that were solicited – whether or not commitment was obtained – Copy this form as necessary

MBE <input type="checkbox"/> WBE <input checked="" type="checkbox"/> DBE <input type="checkbox"/>	TYPES OF SUBCONTRACT WORK OR MATERIALS	DATE SOLICITED April 4, 2014	COMMITMENT MADE <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO (IF YES GIVE DATE)	GIVE REASON(S) IF NO COMMITMENT MADE
CERTIFIED BY: PA Dept of General Services				
COMPANY NAME Pierion Computing Connection	IBM Software Licensing Project Management Deployment Services	SOLICITATION METHOD	MO 4 DAY 4 YR 14	
ADDRESS 10 Long Lane			AMOUNT COMMITTED	
CONTACT PERSON/PHONE			\$	
Debra Pierion		QUOTE RECEIVED <input type="checkbox"/> YES <input type="checkbox"/> NO	% OF TOTAL BID	
EMAIL dpierion@pierioncci.com				
MBE <input type="checkbox"/> WBE <input type="checkbox"/> DBE <input type="checkbox"/>	TYPES OF SUBCONTRACT WORK OR MATERIALS	DATE SOLICITED	COMMITMENT MADE <input type="checkbox"/> YES <input type="checkbox"/> NO (IF YES GIVE DATE)	GIVE REASON(S) IF NO COMMITMENT MADE
CERTIFIED BY:				
COMPANY NAME		SOLICITATION METHOD	MO DAY YR	
ADDRESS			AMOUNT COMMITTED	
CONTACT PERSON/PHONE			\$	
EMAIL		QUOTE RECEIVED <input type="checkbox"/> YES <input type="checkbox"/> NO	% OF TOTAL BID	
MBE <input type="checkbox"/> WBE <input type="checkbox"/> DBE <input type="checkbox"/>	TYPES OF SUBCONTRACT WORK OR MATERIALS	DATE SOLICITED	COMMITMENT MADE <input type="checkbox"/> YES <input type="checkbox"/> NO (IF YES GIVE DATE)	GIVE REASON(S) IF NO COMMITMENT MADE
CERTIFIED BY:				
COMPANY NAME		SOLICITATION METHOD	MO DAY YR	
ADDRESS			AMOUNT COMMITTED	
CONTACT PERSON/PHONE			\$	
EMAIL		QUOTE RECEIVED <input type="checkbox"/> YES <input type="checkbox"/> NO	% OF TOTAL BID	

Prepared By: Shaun P McMullin, Deputy Controller	Date: 4/17/14	Signature: 
Title:		



**pennsylvania**  
DEPARTMENT OF GENERAL SERVICES

July 11, 2013

Debra Pierson  
President  
Pierson Computing Connection  
10 Long Lane, Suite 100  
Mechanicsburg, PA 17050

**Certification Number:** 154433-2012-07-S  
**Expiration Date:** July 23, 2014  
**Business Types:** Information Technology

Dear Debra Pierson:

The Bureau of Small Business Opportunities has reviewed your request for verification along with your supporting documents. I am pleased to inform you that your company has been verified as a Woman Business Enterprise (WBE) based on your certifications with the Pennsylvania Unified Certification Program (UCP) and the Women's Business Enterprise National Council (WBENC) and your small business self-certification registration through the Small Business Procurement Initiative (SBPI). The Commonwealth now recognizes your company as a Small Diverse Business (WBE).

Please understand that the information that you provided for verification was represented as being true and correct. Please know that the Commonwealth shall treat any misstatement as fraudulent concealment of the true facts punishable as a crime under Section 4904 of the Pennsylvania Crime Code, Title 18, of Pa. Consolidation Statutes relating to unsworn falsification to authorities

Your verification is valid until the expiration date noted above. For additional information or assistance, please contact Bureau staff at (717) 783-3119 or by email at [ra-bsboverification@pa.gov](mailto:ra-bsboverification@pa.gov). Best wishes in your business endeavors.

Sincerely,

DeShawn A. Lewis, Director  
Bureau of Small Business Opportunities (BSBO)

***Resumes***

*The Kempe Center for the Prevention and Treatment of Child Abuse and Neglect*

John D. Fluke

Dana M. Hollinshead

Matthew J. Nalty

*Chapin Hall at the University of Chicago*

Fred H. Wulczyn

Robert Gibbons

*Intelligent Outcome Analytics, LLC*

David R. Schwartz

Jonathan D. Prince

### PERSONAL HISTORY AND BIOGRAPHICAL SKETCH:

**Kempe Center for the Prevention and Treatment of Child Abuse and Neglect, Department of Pediatrics, School of Medicine University of Colorado, Anschutz Campus, Aurora, CO**

*Associate Director, Systems Research and Evaluation and Research Associate Professor (2012 to present)*

The Gary Pavilion at Children's Hospital Colorado | Anschutz Medical Campus

13123 East 16th Avenue, B390 | Aurora, CO 80045

Phone: (303) 864-5219 | Fax: (303) 864-5367

[john.fluke@ucdenver.edu](mailto:john.fluke@ucdenver.edu)

Dr. Fluke has over 33 years of experience in social service delivery system research in the area of Child Welfare and Mental Health Services for children. He is internationally recognized as a researcher specializing in assessing and analyzing decision making in human services delivery systems. He is also active in the area of national child maltreatment data collection systems and analysis and has worked with data collection programs in the Balkans, Canada, Saudi Arabia, the US, and for UNICEF. He has conducted research and evaluation at all levels of government, in the private not-for-profit sector, and with national foundations and associations that includes work both in the U.S. and internationally. He is also known for his innovative and informative research and evaluation work in the areas of child maltreatment prevalence, child welfare administrative data analysis, workload and costing, and performance and outcome measurement for children and family services.

At the Kempe Center Dr. Fluke will pursue ongoing research in the area of child welfare decision making, administrative data analysis, and the implementation and scale up of evidence supported interventions. He will also pursue the development child maltreatment epidemiology including applications to international monitoring and evaluation activities. He holds a senior position as a research faculty member, and as a member of the executive team for the Kempe Center. His portfolio includes responsibility for the systems level service delivery research related to child maltreatment including a focus on public health, child welfare, and children's mental health systems. Responsibilities include helping to set overall strategic directions for the center, research and evaluation design, research management analytic consultation, and oversight of other research and evaluation performed by the center. The position is also responsible for specific supervision of grants and contracts as well as research and evaluation staff. The work scope includes research and evaluations related to publically funded services systems and community-based program evaluation for state social service agencies across the country, for the Federal Government, as well as work in other countries.

# JOHN D. FLUKE

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## EDUCATION:

**Ph.D.**, Organizational Decision Science, Union Graduate School, Cincinnati, Ohio, 1995.

Periodic Graduate course work in Economics (Econometrics), Statistics and Mathematics at the University of Colorado in Boulder and Denver, 1981-1990.

**M.A.**, Anthropology, Pennsylvania State University, University Park, Pennsylvania, 1980.

**B.A.**, Summa Cum Laude, Individualized Tutorial Program (ITP), Emphasis in Mathematical Anthropology, University of Northern Colorado, Greeley, Colorado, 1976.

## ACADEMIC APPOINTMENTS:

**Graduate School of Social Work, University of Denver, Denver, CO**

*Visiting Scholar (2008 to Present)*

In his role as visiting scholar at Graduate School of Social Work Dr. Fluke assists the school to improve its approach to developing its child welfare capacity through strategizing with faculty and staff and fulfills educational requirements to provide periodic lectures and other substantive content for faculty and students. In addition Dr. Fluke represents the school in various capacities through serving on external committees and advisory groups.

**Factor Inwentash Faculty of Social Work, University of Toronto, Toronto, Ontario, Canada**

*Status Only Assistant Professor (2012 to present)*

This appointment facilitates coordinated collaboration in the area of research grants, projects and publications. This also includes the development of a graduate level course in child welfare decision making.

## HOSPITAL, GOVERNMENT OR OTHER PROFESSIONAL POSITIONS:

**The American Humane Association, Children's Division, Englewood, CO**

*Director of Program Analysis and Research (1979-1999)*

Senior position involved primary responsibility for the analytic consultation, research, and evaluation performed by the division. Supervision of the agency's research staff consisting of eight research professionals. The work focused on general project design and implementation related to public child protective services and community-based program evaluation for state social service agencies across the

# JOHN D. FLUKE

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country, for the Federal Government and other agencies providing children's services. Dr. Fluke directed or contributed to numerous research and program evaluation projects and provided consultation to many states and to the federal government in the areas of children's services decision making, administrative data analysis, workload and resource management, and automated child welfare information systems.

## **Walter R. McDonald & Associates, Inc., Aurora, CO**

*Director of Research (1999 to 2003)*

These responsibilities emphasized research design and implementation, capturing and analysis of data, and reporting of findings directed toward enhancing the mission of the company. These were achieved through the developing and communicating useful information to clients, provision of direction and support to the research division, linkage of research and evaluation to communications, marketing, and organizational learning.

## **Walter R. McDonald & Associates, Inc., Centennial, CO**

*Vice President for Research (2003 to 2007)*

As a participant with the management of the company the primary responsibilities were to oversee the research and evaluation functions and services of the organization. This position involved oversight for the company's research projects and senior research staff, client relations, and participation in strategic planning and implementation.

## **Child Protective Services Research Center, American Humane Association, Englewood, CO**

*Vice President and Founding Director (2007 to 2012)*

Dr. Fluke rejoined American Humane as the center's founder and director. Established with private funding, the purpose of the research center is to address long-standing issues related to the improvement of public child protective services. Research focuses on fundamental issues in child protective services and the development of evidence-based policy and practices to effectively address them. Among others, the initial areas of focus include assessment and decision-making processes in child welfare cases, examination of the system's racial disparities, improved ways to scale up the implementation of evidence-based intervention and treatment practices at agencies and community service providers, and the further development of a global network of child abuse and neglect data-collection systems and professionals. The Center supports the global network of professionals who form the International Society for the Prevention of Child Abuse and Neglect Working Group on National Child Maltreatment Data Collection Programs for which Dr. Fluke is the co-chair and a network founder.

## **Children's Innovation Institute, American Humane Association, Englewood, CO**

*Vice President (2012)*

In this capacity Dr. Fluke's research work focused on fundamental services to improve the status of children and families including the formation of evidence-based policy and practices. Among others, the initial areas of focus include addressing the epidemiology of vulnerable children, the assessment and decision-making processes in service delivery, and improved ways to scale up the implementation of

# JOHN D. FLUKE

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evidence-based intervention and treatment practices at the community level, in the context of the global network of systems to address the needs of vulnerable children.

## GRANT AND CONTRACT SUPPORT:

Total grants/contracts awarded as Principal Investigator or Co-Principal Investigator: \$39 million

### Current Grant and Contract Support

- **U.S. Health and Human Services, Children's Bureau, No Place Like Home: Family Group Decision Making for Children and Families Receiving In-Home Services (2011-2014):** A federal grant awarded to the American Humane Association (AHA), Casey Family Programs (CFP) and three innovative child welfare agencies with mature family group decision making (FGDM) programs to test the effectiveness of FGDM in safely preventing children from entering or re-entering foster care when they are receiving in-home services. As of July 2012 the grant was transferred to the Larimer County Department of Human Services with the Kempe Center as the primary operating entity responsible to evaluation and technical assistance. The project sites are Larimer County Department of Human Services (LDHS), Colorado; South Dakota Department of Social Services (SDDSS); and Texas Department of Family and Protective Services (TDFPS). All three sites will participate in a rigorous evaluation (experimental or quasi-experimental), longitudinal designs addressing FGDM process, outcomes and cost effectiveness. Dr. Fluke is the Principal Investigator, and the grant was funded for \$1,400,000 over three years.
- **Chapin Hall, Foster Care Redesign for the Texas Department of Family and Protective Services (2010-2012):** The Texas Department of Family and Protective Services is in the process of developing a modified financial system for reimbursing providers of out of home services in order to leverage funds to improve services aimed at creating settings that meet children's needs and that shorten their time in care to planned exits without comprising safety or well being. Under sub-contract to Chapin Hall, Dr. Fluke is the Principal Investigator for the Kempe Center for Children. Funding level \$90,000 over two years.
- **Quality Improvement Center for Differential Response (2008 – 2013):** A federal cooperative agreement awarded to the American Humane Association (AHA) and transferred to the Kempe Center as of July 2012. This project entails 1) development of resources regarding Differential Response (a Child Welfare systems level intervention); 2) financial and technical assistance support of child protective services sub-grantees to evaluate the efficacy of Differential Response being carried out in Colorado, Illinois, and Ohio; 3) a national evaluation of the three sites; and 4) support for doctoral students engaged in dissertation research related to the topic of Differential Response. Dr. Fluke developed and supervised the doctoral dissertation award process, and is responsible for aspects of the cross site evaluation. Total support for this cooperative agreement is \$10,000,000 over 5 years.

### Previously Funded Grant and Contract Support



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- **Canines and Childhood Cancer: Animal Assisted Therapy in the Context of Pediatric Oncology (2011-2012):** This grant was awarded to American Humane Association with the objective of establishing a multi-site longitudinal random control trial to assess the efficacy of Animal Assisted Therapy in improving behavioral health indicators for children with cancer and their caregivers. The study encompasses three phases, a developmental phase to synthesize information and work with potential hospital based sites, a pilot trial in up to three sites, and a full trial. Dr. Fluke is the Principal Investigator for the Pfizer Animal Health grant. Total budget is \$3,000,000 for three years.
- **Center for the Study of Social Policy Alliance for Racial Equity in Child Welfare – Research Literature Review on Disproportionality and Disparities (2010):** This project called for a compilation and analysis of research related to racial and ethnic disproportionality and disparities in child welfare, primarily beginning with research published since Bob Hill's *Research Synthesis in Child Welfare: An Update* (October 2006). The analysis will also compare studies to previously conducted research syntheses by Bob Hill on the topic, as well as any earlier studies that may not have been included in previous papers. Dr. Fluke was the Principal Investigator. Funding level was \$65,000 for 9 months.
- **UNICEF, Cross-National Child Disciplinary Practices: An Analysis of the Multiple Indicator Cluster Survey (MICS) of Households (2009):** Child discipline - deliberate actions on the part of parents designed to teach self-control and acceptable behavior on the part of children – has broad implications for child well-being. In particular, harsh discipline in the form of corporal punishment (not including physical abuse) is associated with adult mental health problems, delinquency, and adult criminal behavior. A clearer understanding of disciplinary practices on a global basis has implications for the development of effective prevention strategies. This study utilized the Multiple Indicator Cluster Survey (MICS3), a representative cross-sectional household survey conducted by UNICEF and its partners, and similar data from the Demographic and Health Surveys (DHS) in over 35 countries. Dr. Fluke was the Principal Investigator. Funding level was \$55,000 for one year.
- **Kingdom of Saudi Arabia National Family Safety Program — Program Report Data Project: (2010):** The purpose of this project was to review and help expand the analytic capacity of the child maltreatment administrative data system under development by the National Family Safety Program (NFSP) in the Kingdom of Saudi Arabia (KSA). The scope of work was carried out by team members of the Child Protection Research Center, through a subcontract to the International Society for the Prevention of Child Abuse and Neglect (ISPCAN). Dr. Fluke was the Principal Investigator. Funding level was \$40,000 for one year.
- **Texas Department of Family and Protective Services (TDFPS), Child Welfare Disparities Initiative Evaluation (2007-2008):** This project entailed supporting TDFPS evaluate its initiative to identify sources of disparities, develop policy, program, and community responses to address disparities, and assess outcomes to determine if outcomes in disparities were impacted. This contract was awarded to Walter R. McDonald and Associates, Inc. (WRMA) and entailed support for the analysis of TDFPS administrative data. The consultation also extended to implementing the evaluation utilizing the Decision Making Ecology framework as a basis for hypotheses. Dr. Fluke was the Principal Investigator for WRMA and project funding was for \$80,000 for one year.

- **Center for Mental Health Services (CMHS), Substance Abuse and Mental Health Services Administration (SAMHSA), Comprehensive Community Mental Health Services for Children and Their Families Program, Phase V (2005 – 2007):** This 5 year national evaluation involving 25 sites was intended to describe the children and families served, including behavioral, emotional, and functional characteristics; determine how children and their families change over time; document the services delivered and the effects and costs of these services; evaluate how systems of care develop over time; investigate the relationship between system change and child and family outcomes; document cultural and linguistic competence; examine the nature and effects of family-driven and youth-guided care; evaluate the effectiveness of factors influencing the implementation of systems of care and evidence-based practices within systems of care; develop evaluation capacity and quality monitoring in system of care communities; and identify factors influencing the sustainability of these programs. Dr. Fluke was the Principal Investigator for the project. Funding level for this project was in excess of \$27,000,000 for five years.
- **ORC Macro, Subcontract for the Cross Site Evaluation of the National Child Traumatic Stress Initiative of the Substance Abuse and Mental Health Services Administration, Department of Health and Human Services (2004 – 2007):** This 5 year project entailed the design and implementation of a national cross site evaluation for the National Child Traumatic Stress Initiative, a network of over 50 sites that provides direct and indirect services aimed at supporting the development of trauma informed services. WRMA was a subcontractor to ORC Macro, and Dr. Fluke was the WRMA Principal Investigator and was the co-leader of the evaluation design team. The funding was \$800,000 for five years.
- **Office of the Assistant Secretary for Planning and Evaluation, Department of Health and Human Services, Secondary Analysis of Data from the National Child Abuse and Neglect Data System (2003–2006):** A data analysis project to examine three topics of policy concern related to the identification and amelioration of child maltreatment. The topics are male perpetrators, alternative response, and a longitudinal analysis. Dr. Fluke is the Principal Investigator for the project. Funding was for \$350,000 for 3 years.
- **Performance And Outcome Reporting System, Department of Public Social Services, County of Riverside California (2002 - 2003):** Dr. Fluke was the Principal Investigator on this project to develop a performance and outcome reporting system, and was the corporate officer. The project is directed at developing a measurement system for services provided by Community Based Agencies under the auspices of the Child Abuse Prevention, Intervention, and Treatment (CAPIT) program and the Promoting Safe and Stable Families (PSSF) program. Funding was \$120,000 for one year.
- **Foster Care Re-Entry Study, Division of Child Welfare Services, Colorado Department of Human Services (2001- 2002):** An analysis of administrative data to address children who re-enter foster care within twelve months of reunification to identify patterns in demographic and service activities that might explain re-entry and impact the Adoption and Safe Family Act reunification standards. Dr. Fluke was the Principal Investigator responsible for all aspects of this study. Funding was \$35,000 for one year.

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- **F2F/Internet Training for Data-Based ASFA/MEPA Decision Making, School of Social Work, University of Texas at Arlington (2000 – 2003):** A three year grant through the Children's Bureau, Administration of Children Youth and Families to develop and test a training curriculum on the Adoption and Safe Families Act performance measures for the Texas Department of Protective and Regulatory Services. The project entails the development of an internet based training and the use of On Line Analytic Processing methods as a basis for the data used in the training. Dr. Fluke was the Principal Investigator of the WRMA subcontract funded at \$100,000 per year for three years.
- **Texas Department of Protective and Regulatory Services, Texas Title IV-E Adoption Assessment Waiver Demonstration Project Cost-Effectiveness Analysis Project, (2001–2003):** This project was to assess the cost-effectiveness of its title IV–E waiver on adoptions. The project linked with the overall evaluation of the project and utilized performance measures and cost data that were derived, as well as administrative data resources. Dr. Fluke was the Principal Investigator responsible for all aspects of the study and developed an administrative-level computer simulation model to support administrative assessment of program efficacy and in forecasting the impacts of changes in services due to the introduction of new policy. This was one aspect of an on-going multi-year research project of the Department, funded in part by a research grant from the HHS Children's Bureau. Funding was for \$250,000 over a two year period.
- **Evaluation Infrastructure Development, Orange County Children's Commission (2000- 2001):** The project called for the development of common protocols for evaluation to be employed by evaluators of programs funded by the Orange County Children's Commission. Dr. Fluke was the Project Principal Investigator responsible for all aspects of the study. Funding was for \$55,000 for a one year period.
- **Benefits Workload Study, San Mateo County Human Services Administration (2000-2001):** A project to assist the county obtain and analyze workload data for purposes of workload standard setting, budgeting and workload allocation for CalWORKs/TANF, Medicaid, Food Stamps and other benefits programs. Dr. Fluke was the Project Principal Investigator responsible for all aspects of the study. Funding was for \$200,000 for a one year period.
- **Senate Bill 2030 Workload Study, California Department of Social Services (1999-2000):** A twelve month statewide project to assist the state obtain and analyze workload data for purposes of workload standard setting, budgeting and workload allocation in the area of child welfare services. Dr. Fluke was the Project Principal Investigator responsible for all aspects of the study including staffing, study design, data analysis and reports. Funding was \$1,200,000 for the year.
- **Workload Project; Arizona Department of Economic Security Administration for Children, Youth and Families (1998-1999):** A six month project to assist the state obtain and analyze workload data for purposes of budgeting and workload allocation. Dr. Fluke was the principal investigator. The funding was for \$175,000.

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- **Colorado Caseload Study; Department of Human Services Division of Child Welfare Services (1998-1999):** A project to calculate and report on average caseload size for the state and counties to address the requirements of Colorado Child Welfare Settlement Agreement to reduce caseloads. The project also entails the development of recommendations regarding a workload measurement for child welfare in Colorado. Dr. Fluke was the Principal Investigator for AHA for funding of \$35,000.
- **Illinois Outcome Measures Project (1997-2000):** A project to assist the University of Illinois Children's Research Center develop procedures and analyze administrative data related to the production of outcome measures for use in court monitoring. Dr. Fluke was the Principal Investigator and the project was funded for \$80,000.
- **Colorado Analytic Data Base Development; Department of Human Services Division of Child Welfare Services (1997-2000):** A project to develop an analytic data base from extracts from the Colorado foster care data system and child protective investigation system. The project also involved training the Colorado staff in the analytic data base construction methods. Dr. Fluke was the Principal Investigator for AHA. Project funding was \$35,000.
- **Dynamics of Unsubstantiated Reports: A Multi-State Study (1997–2001):** This project was a federal research grant to understand unsubstantiated dispositions in a multi-State context. The objectives were to develop an understanding of how the characteristics of law, policy, practice, case and decision-making are related to the distribution of unsubstantiated dispositions and the outcomes of unsubstantiated dispositions. Dr. Fluke was the Principal Investigator for the grant. Funding was for \$250,000 per year.
- **Idaho Risk Assessment Project (1997-2000):** A three year project to assist the Idaho Department of Family and Children Services develop an approach to risk and safety assessment. The project entails the development of a risk assessment and safety assessment protocol, instrument, training, and evaluation. Dr. Fluke was one of the project Co-Principal Investigators funded by the state for \$150,000.
- **Iowa Outcome Measures Project (1997-1999):** A project to design an outcome measures data collection system for the Iowa Department of Adult, Family, and Children Services. The project will address the definition of outcome domains and indicators for Iowa as a whole, the development of community outcomes for a selected range of sites, and the development of a system for results based budgeting. Dr. Fluke was one of the project Co-Principal Investigators and the funding was for \$130,000.
- **Casey Managed Care Initiative (1997-2000):** This initiative was developed by Annie E. Casey Foundation and Casey Family Services to assist children's services agencies address the issues associated with the proliferation of managed care approaches in the field. During the first eighteen months the project objectives are to develop a principles document, an outcome measures framework and model set of decision making protocols. The American Humane Association is the lead agency in a consortium of national organizations including the Institute for Human Services Management and the American Bar Association. Dr. Fluke was the Principal Investigator for the \$200,000 project.

## JOHN D. FLUKE

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- **Colorado Subsidized Guardianship Project; Department of Human Services Division of Child Welfare Services (1996-1997):** The project objectives were to explore models of cost benefit analysis in the area of subsidized guardianship policies for kinship care and to develop a computer simulation with parameters derived from Colorado foster care data to address cost benefit concerns. The simulation model was designed to address a range of policy scenarios and assist the state in developing its subsidized guardianship policy. A versions of the Children's Services Simulation Model was used as a base for the simulation and modified to address the project needs. Dr. Fluke was the Principal Investigator for AHA for funding of \$45,000.
- **Innovative Programs with Child Protection Linkages (1995-1997):** As a part of the Clark Foundation Child Welfare Reform Initiative this project includes an in-depth on-site study of two innovative programs: the PATCH model in Cedar Rapids Iowa, and Family Group Decision Making implemented in Oregon. The study entails a systematic analysis of the programs, policies, staffing and operations. It also includes an ethnographic analysis of four families at each site. Dr. Fluke was the Principal Investigator of the evaluation component of the project where the entire project was funded for \$180,000.
- **Philadelphia Outcome Measures Project (1996-2000):** This three year project entailed implementing an outcome measures data collection system for the City of Philadelphia's Children and Youth Division. Included in the development process are measures of in-home services, short term placement services, and long term placement services. Dr. Fluke was one of the project Co-Principal Investigator. Over three and a half years the project was funded for approximately \$600,000.
- **Illinois Child Endangerment Protocol (1994-2000):** A project to assist the state of Illinois to develop a Child Endangerment Protocol for the Department of Children and Family Services, including developing instrumentation for assessing safety, curriculum for child safety, development of a process for certifying worker competence in regard to risk and safety and evaluation of the reliability and validity of the protocol. Dr. Fluke was the Principal Investigator. The project funding was \$325,000.
- **Rhode Island Workload Management Project (1994-1995):** The project objectives were to develop unit of service definitions, case work practice standards, workload standards, define a system to promote workload equity and to develop a decision support system to assist DCYF supervisors and administrators maintain equitable workloads. Dr. Fluke was the project Principal Investigator for the AHA subcontract where the subcontract was for \$180,000.
- **Kentucky Staffing and Workload Evaluation (1992-1993):** The American Humane Association assisted the Kentucky Department of Social Services by providing an evaluation of child protective service workloads and examining current child welfare practice expectations. Dr. Fluke was Co-Principal Investigator of the project and funding was for \$55,000.
- **Evaluation of the Pennsylvania Approach to Child Protective Service Risk Assessment (1991-1993):** AHA under contract to Erie County Office of the Children, Youth, and Families and the Pennsylvania Office of Children, Youth, and Families conducted several related sub-studies including ascertaining the effects of risk assessment implementation on selected aggregate system variables;

## JOHN D. FLUKE

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determining the psychometric properties of three risk assessment models and of the 18 core factors; designed a study and implemented the examination of predictive validity; and determined the impact of risk assessment implementation on worker and agency operations. Dr. Fluke was the Principal Investigator and the project was funded for \$230,000.

- **Program Classification and Child Evaluation/Referral Systems for New York City's Foster Care Program; American Bar Association Subcontract (1990):** This project involved assisting NYC develop an information system to match children with appropriate placement resources consistent with the terms of Wilder consent decree. Dr. Fluke was the subcontract Principal Investigator and the subcontract was for \$60,000.
- **Child Protective Services Unit Costing and Service Optimization Project (1990):** The purpose of this project was to develop a unit costing technology that administrators could use for ongoing analysis and financial planning for the Texas Department of Protective and Regulatory Services. The data were combined into a software model that prepares information system extract files for organization and analysis on a system composed of personal computers. The project included initial development of a computer model for optimizing service delivery based on workloads, costs and case outcomes. Dr. Fluke was the Principal Investigator with funding of \$90,000.
- **Maryland Workload Analysis and Baseline Evaluation Study (1988-1989):** The purpose of this study was to obtain data on key performance indicators related to the provision of child protective services to serve as a baseline for comparison with similar data to be collected after implementation of a comprehensive state plan to include risk assessment, a new data system, a worker support system, and a competency-based training curriculum. The project also included a workload study to develop CPS workload standards for the state. Dr. Fluke was Principal Investigator. This project was funded for \$40,000 and supplemented by the National Resource Center on Child Protection.
- **Child Protective Services Risk Assessment Reliability Study (1988-1989):** The purpose of this project was to assess the reliability of a risk assessment instrument developed for use by Colorado CPS workers throughout the case process. Dr. Fluke was the Principal Investigator and the project was funded for \$30,000.
- **Screening in Child Protective Services (1986-1988):** This project, performed under sub-contract to the American Bar Association, focused on screening and prioritization at intake in five states and twelve communities to determine if CPS policy has an effect on actual CPS practice at the point of intake. Data to conduct the study were obtained from a national survey of state laws and policies; a survey of 100 county administrators and supervisors regarding local screening and prioritization; an on-site study of CPS screening in 12 communities from 5 states; a survey of representatives from community agencies in the 12 participating communities; and case registry follow-up of children who were subjects of CPS contacts during the study period. Dr. Fluke was the sub-contract Principal Investigator and the American Humane Association sub-contract was for \$60,000 per fiscal year.
- **Protective Services Hot-line Feasibility Study; Arizona Department of Economic Security (1986):** This study entailed a statewide assessment of the need for a statewide hotline, and resulted in a

# JOHN D. FLUKE

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recommendation that it was probably not warranted at the time. Dr. Fluke was the Principal Investigator with funding of \$90,000.

- **Inter-Installation Study of Family Advocacy Central Registry Data Collection Procedures; Office of Family Policy and Support, Department of Defense (1989-1990):** This project involved identifying variations and inconsistencies in data collection procedures. Recommendations were made related to improving data collection procedures. Dr. Fluke was the Principal Investigator and funding was for \$45,000.
- **Family Advocacy Central Registry Data Utilization Project; Office of Family Policy and Support, Department of Defense (1989-1990):** The purpose of this project was to develop training for DOD Central registry staff on data utilization. Dr. Fluke was the Principal Investigator and funding was for \$35,000.
- **Ohio Workload Analysis and Resource Management Project (1988-1989):** The purpose of this project was to define meaningful child welfare service units, to analyze the characteristics of the child welfare workload, to expose administrative staff to the unit costing method, and to develop CPS workload standards that could be implemented in the four participating Ohio counties. Dr. Fluke was Principal Investigator, where funding was \$40,000 and supplemented by the National Resource Center on Child Protection.
- **National Child Abuse and Neglect Reporting Study; National Center on Child Abuse and Neglect; Federal Health and Human Services (1979-1988):** This multi-year grant was the pioneer effort to collect and report on state child abuse and neglect reports. It involved the collection and analysis of both aggregate and case level data and was the antecedent of the NCANDS project. Dr. Fluke was originally a research analyst and became the Principal Investigator, where the project was funded for \$250,000 per year.

## OTHER RESEARCH ACTIVITIES:

- **Washington State DSHS Children's Administration, Washington State Workload Study (2006-2007):** A study to develop recommendations for workload standards for Child Welfare services. The study entailed collection of workload data from over 2,000 staff and the development of cost benefit information to support the implementation of a State Wide Automated Child Welfare Information System. Dr. Fluke was the Strategic Advisor for the project. Funding for the project was \$250,000 for 18 months.
- **New York State Office of Children and Family Services, Study of Child Welfare Workload (2006):** This study concerned the development of workload requirements for child protective services, foster care, adoption, and preventive services in the State of New York, including both the public and private voluntary sectors. The study addressed the services and tasks conducted by case workers in their case management and case planning functions. Dr. Fluke was the Analytic Consultant for this project. Funding for the project was \$300,000 for 18 months.

- **American Bar Association (ABA), Division of Children and the Law, Judicial Dependency Workloads (2005-2006):** WRMA is assisting the ABA in piloting a methodology to measure judicial workloads as related to best practice. The process involves collecting time log data from judges; supplemental data from trained court observers; Delphi Group data on time estimates; and judicial automated systems data. Dr. Fluke researched the development of best practice based workload standards for judges and for estimating workload requirements. Dr. Fluke helped design the study and provided consultation and analytic support for this project. Funding for the project was \$100,000 for 9 months.
- **Children's Bureau, Administration for Children Youth and Families, U.S. Health and Human Services, Fourth National Incidence Study of Child Abuse and Neglect (2004–2007):** Walter R. McDonald & Associates, Inc., is a subcontractor to WESTAT on this project which entails developing and implementing a complex sentinel sampling design to measure child maltreatment incidence. Dr. Fluke is a member of the team involved with aspects of the research design and is a member of the technical advisory group for the project. The funding was for \$400,000 for 3 years
- **The Development of a Statewide Approach to the Assessment of Child Safety, Family Strengths and Caregiver Protective Capacity, California Department of Social Services (2003):** Under sub-contract to Patricia Schene and Associates, Dr. Fluke assisted the State in developing a uniform approach to child and family assessments for the State. The assessments address critical aspects of the Child Protective Services re-design effort, including a new system of diversified response. Funding was for \$40,000 for six months.
- **Aurora Community Mental Health Center, Evaluation of the Aurora Mental Health Center's Grant to Operate a National Child Traumatic Stress Initiative Community Treatment and Service Center (NSCTI-CTS) (2002 – 2004):** Dr. Fluke has operated as consultant to the Center in developing its approach to evaluation and provides evaluation technical assistance to staff who are planning and running programs under the auspices of the grant. Funding of \$45,000 was for two years.
- **National Study of Child Protective Services Systems and Reform Effort, Office of the Assistant Secretary for Planning and Evaluation, Department of Health and Human Services (2000-2003):** The goal of this study was to provide a comprehensive description of child protective services (CPS) systems nationwide and to examine in depth some of the recent innovative reform efforts that are underway. Dr. Fluke was the team leader for the data analysis and reporting component. The project was funded for \$850,000 for a two and half year period.
- **Louis de la Parte Florida Mental Health Institute, Department of Children and Family Studies, University of South Florida, Technical Assistance in Developing Child Welfare Performance Measurement Reporting (2000-2001).** The purpose of this project was to assist the institute in its work the Florida Department of Children and Families to analyze the State's administrative data and prepare an annual report regarding the performance of its foster care system and overall performance of its child welfare program. The role was to act as a project advisor and technical assistance consultant. Funding was for \$20,000 over a one year period.



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- **Texas Screening, Permanency and Decision Making Study (1993-2000):** An on-going multi-year research project of the Texas Department of Protective and Regulatory services funded in part by a research grant from the HHS Children's Bureau. The goal of the project was to develop decision making tools for use by workers and supervisors in reaching decisions about screening reports of child maltreatment, providing services, making placements, and closing cases. Dr. Fluke was been an active member of the study advisory committee and a member of the research team. Under the auspices of this project Dr. Fluke developed the Children's Services Simulation Model (CSSM) an interactive mathematical model designed to assist program management in forecasting the impacts of changes in services due to the introduction of new policy.
- **The National Resource Center on Child Abuse and Neglect (1991-1996):** The National Resource Center on Child Abuse and Neglect (NRCCAN) is operated by the American Humane Association as the United States government's center for resources and services to improve the capacity of public and private agencies to respond effectively to the problem of child abuse and neglect. Dr. Fluke was a project consultant and advisor and was the project manager for the first year.
- **Colorado Family Preservation (1994-1995):** The American Humane Association's purpose and objective for this project is to help the State ensure that the planning process is as comprehensive as possible and meets federal requirements to involve a wide cross-section of the community in the development of the five-year plan. Dr. Fluke assisted in developing the evaluation component of the plan.
- **Illinois Staff Development (1992-1993):** American Humane Association was contracted to develop training resources by analyzing the current tasks being performed by child protection investigators and then to develop competencies needed to perform the tasks. Dr. Fluke assisted in the development of an evaluation of training needs and competencies.
- **Grand Rapids Michigan Children's Service Needs Assessment (1994-1995):** The American Humane Association conducted a research study of families to address the pertinent demographic characteristics of client groups, how these families fall into high, moderate or low risk categories for future maltreatment, the specific services needed by the families, and the projected costs for services. Dr. Fluke was a consultant to the project.
- **Navy Family Advocacy Program Risk Assessment Consultation (1993):** The purpose of the project was to assist the Navy to develop a Family Advocacy Program Risk Assessment System. The system was designed to be implemented throughout the Navy. Dr. Fluke was a project consultant.
- **National Resource Center for Child Abuse and Neglect (1986-1990):** National Center Child Abuse and Neglect, Federal Health and Human Services. This was a five year grant to operate a resource center to address the systemic needs of service providers and particularly CPS agencies. Dr. Fluke was project manager.

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- **Comprehensive Review and Recommendation for Child Protective Services Policy (1985):** Wyoming Department of Public Assistance and Social Services and South Carolina Department of Social Services. These were broad based evaluations of CPS for these states. Dr. Fluke analyzed the state policy documents.
- **Analysis of State Agency Variation in Reporting and Disposition; Virginia Department of Social Services (1983):** The purpose of the project was to evaluate the variation in reporting practices between counties. Dr. Fluke performed the analysis of the central registry data.
- **Technical Assistance for the National Child Abuse and Neglect Data System (1991-2000):** Subcontract to Walter McDonald and Associates. The American Humane Association assists the National Center on Child Abuse and Neglect develop, collect and analyze national data on child abuse and neglect reports including aggregate reporting data from between 48 and 50 states each year and state submitted case level data. Dr. Fluke was the subcontract project manager.
- **Child Welfare Decision Enhancement Project (1993-1995):** Texas Department of Protective and Regulatory Services. Dr. Fluke was a research consultant to this project.
- **Management Information System Design; Project SAFE Department of Defense (1985-1986):** The objective of the project was to develop a system approach to data collection across multiple programs. Dr. Fluke was a research analyst.
- **Analysis of Family Advocacy Reporting System; Department of the Navy (1983-1984):** The Navy contracted with American Humane Association to perform the first analysis of its reporting data. Dr. Fluke was the research analyst for the project.

## TEACHING:

**Decision Making in Child Welfare:** Summer-2013-SWK6503H-F-LEC0101 – University of Toronto, Factor Inwentash Faculty of Social Work - 3 Credit Hours (May 13 – 17, 2013): A graduate doctoral level course addressing theories, empirical literature, research, and practice in the area of child welfare decision making. Research specific to child welfare research topics include approaches and analytic techniques that support decision making research and topics such as study design, data construction techniques, receiver operator characteristics analysis, structural equation modeling, and multi-level modeling.

## PRIVATE CONSULTATION:

**Consultant (1997-1998)** Workload Measurement for Services to the Developmentally Disabled, State of Washington Department of Social and Health Services, Olympia, Washington.

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**Consultant** (1995-1998) Expedited Permanency Program Evaluation, Patricia Schene, Littleton, Colorado.

**Consultant** (1995) Adoption Yardstick Project, Child Welfare Research Center, University of California, Berkeley, California.

**Consultant** (1991) California Integrated Service Agency Project, Fourtech Corporation.

**Consultant** (1983-1988) Animal Welfare and Control Information System; Metropolitan Animal Services Council.

**Consultant** (1986) Social Services Reporting System: Adoptions, Sperry Corporation.

## MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS:

*Founding Member*, International Society for the Prevention of Child Abuse and Neglect (ISPCAN) Working Group on Child Maltreatment Data (ISPCAN-WGCMD).

*Member*, International Society for the Prevention of Child Abuse and Neglect.

*Member*, American Professional Society on the Abuse of Children.

*Member*, Society for Social Work Research

## GOVERNMENT AND COMMUNITY:

### Present

*Member* - Expert Advisory Group on the Child and Family Service Review Outcome Indicators, USHHS Childrens Bureau, Administration for Children and Families

*Advisory Board Member*, Center for Violence and Injury Prevention, George Warren Brown School of Social Work, Washington University, St. Louis, MO, USA.

*Partner*, Preventing Violence across the Lifespan Network (PreVAil), partnership of researchers and from Canada, United States, United Kingdom, Asia, Europe and Australia, Housed at McMaster University, Hamilton, Ontario, Canada.

### Past

*Advisor*, Central Independent Advisory Board, Balkan Area Epidemiological Study of Child Abuse and Neglect, Institute of Child Health Department of Mental Health and Social Welfare Centre for the Study and Prevention of Child Abuse and Neglect, Athens, Greece.

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*Chair, Focal Question Workgroup - Systems, Strategies and Interventions for Sustainable Long-Term Care and Protection of Children with a History of Living Outside of Family Care, U.S. Government Evidence Summit: Protecting Children Outside of Family Care for the U.S. Agency for International Development (USAID), October 2011 – September, 2012.*

*Doctoral Committee Member for Dana M. Hollinshead. Heller School for Social Policy and Management Brandeis University Successful defense July 2012.*

*Technical Advisor to the National Incidence Study on Child Abuse and Neglect.*

*Consultation Convener, International Study on Violence against Children, United Nations.*

*Technical Advisor on Risk Assessment Research to the Faculty of Social Work, University of Toronto.*

*Technical Advisor to the Outcomes Initiative of the New Zealand Children and Young Persons & their Families Service.*

*Technical Advisor to the Canadian Incidence Study of Reported Child Abuse and Neglect.*

*Technical Advisor to the Commission on the Role of Culture and the Assessment of Risk in African American Children and Families, Black Administrators in Child Welfare.*

*Co-Convener, Roundtable on Child Protective Services Risk Assessment.*

*Advisory Board for the National Child Abuse and Neglect Data System.*

*Research Advisory Board for the Texas Risk Assessment Evaluation.*

*Board Member, Mental Health Service, Inc.*

*Board Member and Board President, Aurora Community Mental Health Center.*

*Board Member, Arapahoe County Placement Alternatives Commission.*

## ***Other***

**Attorney General of Massachusetts. Children's Rights Lawsuit Connor B. vs. Deval Patrick (2012):** Dr. Fluke is a scientific expert witness for the defendants in the case brought against the State of Massachusetts Department of Children and Families.

**Riggs, Abney, Neal, Turpen, Orbison & Lewis. D.G. vs. Henry (2011):** Dr. Fluke is a scientific expert witness for the defendants in the case brought against the State of Oklahoma Department of Human

Services regarding its foster care system.

**Class Action Lawsuit Alleging Inadequate Child Welfare Services Due to Large Caseloads (1990-1991):** Legal Services Organization of Indiana. Dr. Fluke was an expert witness.

## **REVIEW AND REFEREE WORK:**

Editorial Board, Journal of Technology in Human Services. (2003-present)

Guest Editor, Journal of Child Abuse and Neglect. (2012)

Editorial Board, Journal of Child Abuse and Neglect. (2013-present)

Ad-Hoc Reviewer:

Victims and Violence. (1990-present)

Protecting Children (1991-present)

Journal of Child Abuse and Neglect (1992-present)

Children and Youth Services Review (2007-present)

Journal of Interpersonal Violence (2009 –present)

Child Maltreatment (2009 – present)

Pediatrics (2010 - present)

## **DOCTORAL COMMITTEE MEMBERSHIPS**

Dana M. Hollinshead, PhD Awarded July 2012 by The Faculty of the Heller School for Social Policy and Management, Brandeis University: Dissertation - Do Outcomes Reflect Performance, Demographic Dividends, or Policy Artifacts? A Study of the Effects of Child Welfare Policies, Practices, and Demographics on State Child Maltreatment Recurrence Rates,

## **PEER REVIEWED PUBLICATIONS (35):**

1. Fluke, J.D., & O'Beirne, G. (1988). Prospects for artificial intelligence in cps reorganization efforts. *Protecting Children*, 4 (4), 7-10.
2. Fluke, J., Edwards, M., and Stith, R. (1989). The cost of child protective services. *Protecting Children*, 6 (3), 25-29.
3. Fluke, J. & O'Beirne, G. (1989). Artificial intelligence: An aide in child protective service caseload control systems. *Computers in Human Services*, 4, 101-109.
4. Wells, S.J., Stein, T.J., Fluke, J., & Downing, J. (1989). Screening in child protective services. *Social Work*, 34 (1), 45-48.

5. Downing, J. D., Wells, S. J., & Fluke, J. (1990). Gatekeeping in child protective services: a survey of screening policies. *Child Welfare*, LXIX (4), 357-369.
6. Nassar, R., & Fluke, J. (1991). Pet population and dynamics and community planning for animal welfare and animal control. *Journal of the American Veterinary Medical Association*, 198 (7), 1160-1164.
7. Wells, S.J., Downing, J., & Fluke, J.D. (1991). Responding to reports of child abuse and neglect. *Children & Youth Services Review*, 15 (2), 63-72.
8. Wells, S.J., Fluke, J., D., & Brown, C. H. (1995). The decision to investigate: Child protection practice in 12 local agencies. *Children and Youth Services Review*, 17 (4), 523-535.
9. Fluke, J., Yuan, Y. T., & Edwards, M. (1999). Recurrence of maltreatment: an application of the national child abuse and neglect data system (NCANDS). *Child Abuse & Neglect*, 23 (7), 633 – 650.
10. Poertner, J., Bussey, M., Fluke, J. (1999). How safe are out-of-home placements? *Children and Youth Services Review*, 21 (7), 549-563.
11. Fluke, J., Edwards, M., Kutzler, P., Kuna, J., & Tooman, G. (2000). Safety, permanency, and in-home services: Applying administrative data. *Child Welfare*, LXXIX (5) September/October, 573-596.
12. Fluke, J., Edwards, M., Bussey, M., Wells, S., & Johnson, W. (2001). Reducing recurrence in child protective services: Impact of a targeted safety protocol. *Child Maltreatment*, 6 (3), August, 207-218
13. Fluke, J., Parry, C., Shapiro, P., Hollinshead, D., & Bollenbacher, V. (2002). The case on unsubstantiated cases. *Policy & Practice*, 60 (3), 16-22.
14. Tooman, G., & Fluke, J. D. (2002). Beyond caseload: What workload studies can tell us about enduring issues in the workplace. *Protecting Children*, 17(3), 48-59.
15. Fluke, J.D., Yuan, Y.T., Hedderson, J., & Curtis, P. A. (2003). Disproportionate representation of race and ethnicity in child maltreatment: Investigation and victimization. *Children and Youth Services Review*, 25 (5/6), 359–373.
16. Schene, P., Caffaro, J., & Fluke, J. (2004). The importance of assessment in child welfare. *Policy & Practice*, 62 (4), 14-18.
17. Schoech, D., Fluke, J.D., Basham, R., Baumann, D. J., & Cochran, G. (2004). Visualizing multilevel agency data using olap technology: An illustration and lessons learned. *Journal of Technology in Human Services*, 22 (4), 93-111.

18. Schoech, D., Basham, R., & Fluke, J.D. (2006). A technology enhanced EBP model. *Journal of Evidence-Based Social Work*, 3 (3/4), 55-72.
19. Fluke, J., Shusterman, G., Hollinshead, D., & Yuan, Y.T. (2008). Longitudinal analysis of repeated child abuse reporting and victimization: multistate analysis of associated factors. *Child Maltreatment*, 13 (1), 76 – 88.
20. Fluke, J. (2008). Child protective services rereporting and recurrence—Context and considerations regarding research. *Child Abuse & Neglect*, 32 (8), 749-751.
21. AlEissa, M. A., Fluke, J.D., Gerbaka, B., Goldbeck, L., Gray, J., Hunter, N., Madrid, B., Van Puyenbroeck, B., Richards, I. & Tonmyr, L. (2009). A commentary on national child maltreatment surveillance systems: Examples of progress. *Child Abuse & Neglect*, 33 (11), 809–814.
22. Fluke, J. (2009). Allegory of the cave: On the theme of substantiation. *Child Maltreatment*, 14, 69-72.
23. Fluke, J., Chabot, M., Fallon, B., MacLaurin, B., & Blackstock, C. (2010). Placement decisions and disparities among aboriginal groups: An application of the decision making ecology through multi-level analysis. *Child Abuse & Neglect*, 34 (1), 57-69.
24. Fallon, B., Trocme, N., Fluke, J., MacLaurin, B., Tonmyr, L., & Yuan, Y. (2010). Methodological challenges in measuring child maltreatment. *Child Abuse & Neglect*, 34 (1), 70-79.
25. Fluke, J. & Oppenheim, L. (2010). Getting a grip on systems of care and child welfare using opposable thumbs. *Evaluation and Program Planning*, 33 (1), 41-44.
26. Drake, B., Jolley, J., Lanier, P., Fluke, J., Barth, R., & Jonson-Reid, M. (2011). Racial bias in child protection? A comparison of competing explanations using national data. *Pediatrics*, 127 (3), 471-8.
27. Detlaff, A., Rivaux, S., Baumann, D. J., Fluke, J.D., & Rycraft, J. R. (2011), Disentangling substantiation: the influence of race, income, and risk on the substantiation decision in child welfare. *Children and Youth Services Review*, 33 (9), 1630-1637.
28. Gilbert, R., Fluke, J., O'Donnell, M., Gonzalez-Izquierdo, A., Brownell, M., Gulliver, P., Janson, S., & Sidebottom, P. (2012). Trends in child maltreatment in six developed countries. *Lancet*. 379(9817):758-72.
29. Fallon, B., Trocme, N., Fluke, J., Van Wert, M., MacLaurin, B., Sinha, V., Helie, Sonia, Turcotte, D. (2012). Responding to child maltreatment in Canada: Context for international comparisons. *Advances in Mental Health*. 11(1) 76 - 86.

30. Fluke, J., Goldman, P., Shriberg, J., Hillis, S., Yun, K., Allison, S., Light, E. (2012). Systems, strategies, and interventions for sustainable long-term care and protection of children with a history of living outside of family care. *Child Abuse and Neglect* 36(10) 722– 731.
31. Maholme, V., Fluke, J., Rinehart, R.D., and Huebner, G. (2012). Foundations in the literature for evidence supported approaches for vulnerable children in low and middle income countries: the US government summit on children outside of family care. *Child Abuse and Neglect* 36(10) 685-8.
32. Gyamfi, P., Lichtenstein, C., Fluke, J., Xu, Y., Lee, S. and Fisher, S. (2012). The relationship between child welfare involvement and mental health outcomes of young children and their caregivers receiving services in system of care communities. *Journal Of Emotional And Behavioral Disorders* 20(4) 211-225.
33. Chabot, M., Fallon, B., Tonmyr, L., Maclaurin, B., Fluke, J., and Blackstock C. (2013). Exploring alternate specifications to explain agency-level effects in placement decisions regarding aboriginal children: Further analysis of the Canadian Incidence Study of Reported Child Abuse and Neglect Part B. *Child Abuse Neglect*. 37(1): 61-76.
34. Fallon, B., Chabot, M., Fluke, J., Blackstock, C., Maclaurin, B., and Tonmyr, L. (2013). Placement decisions and disparities among Aboriginal children: Further analysis of the Canadian incidence study of reported child abuse and neglect part A: Comparisons of the 1998 and 2003 surveys. *Child Abuse Neglect*. 37(1): 47-60.
35. Fluke, J., Merkel-Holguin, L. and Schene, P. (2013). Thinking differentially: a response to issues in differential response. *Research on Social Work Practice*. 23(5) 545-9.
36. Jud, A., Fluke, J., Alink, L. R. A. Allan, K., Fallon, B., Kindler, H., Joo Lee, B., Mansell, J., & Puyenbroek, B. (2013). On the nature and scope of reported child maltreatment in high-income countries: Opportunities for improving the evidence-base. *Paediatrics & International Child Health*. DOI:10.1179/2046905513Y.0000000092
37. Putnam-Hornstein, E., Wood, J., Fluke, J., Yoshioka-Maxwell, A., & Berger, R.P. (2013). Risk factors for severe and fatal child maltreatment. *Child Welfare* 92(2) 59-76.

## **MONOGRAPHS, MAJOR REPORTS, BOOK CHAPTERS, AND BOOK REVIEWS (35):**

### **Books and Monographs**

1. Fluke, J.D., (1995) **The Children's Services Simulation Model (CSSM)**, Doctoral Dissertation, Union Institute Graduate School: Cincinnati, OH.



2. Kern, H., Baumann, D., & Fluke, J. (1997). **Worker Improvements to the Decision and Outcome Model (WISDOM): The Child Welfare Decision Enhancement Project.** Austin: Texas Department of Protective and Regulatory Services.
3. Fluke, J., Parry, C., Shapiro, P., Hollinshead, D., Bollenbacher, V., Baumann, D. (2001). Davis-Brown, K., **The Dynamics of Unsubstantiated Reports: A Multi-State Study – Final Report,** Denver, Colorado: The American Humane Association.
4. Fluke, J.D., & Hollinshead, D. (2003). **Child Maltreatment Recurrence: A Leadership Initiative of National Resource Center on Child Maltreatment.** National Resource Center on Child Maltreatment, Duluth, GA.
5. Baumann, D. J., Fluke, J. Graham, J. C., Wittenstrom, K., Hedderson, J., Riveau, S., Detlaff, A., Rycraft, J., Ortiz, M. J., James, J. Kromrei, L., Craig, S., Capouch, D., Sheets, J., Ward, D., Breidenbach, R., Hardaway, A., Boudreau, B., & Brown, N. (2009). **Disproportionality in Child Protective Services: The Preliminary Results of Statewide Reform Efforts.** Austin: Texas Department of Family and Protective Services.
6. Wulczyn, F., Daro, D., Fluke, J., Feldman, S., Glodek, C., Lifanda, K. (2009). **Adapting a Systems Approach to Child Protection: Key Concepts and Considerations.** Chapin Hall at the University of Chicago: Chicago.
7. Baumann, D.J., Dalgleish, L., Fluke, J., Kern, H. D. (2011). **The Decision Making Ecology.** American Humane Association: Denver.
8. UNICEF. (2011). **Child Disciplinary Practices at Home,** New York: UNICEF (contributing author).
9. Jenkins, M., Ruehrdanz, A., McCullough, A., Casillas, K., & Fluke, J.D. (2012). **Canines and Childhood Cancer: Examining the Effects of Therapy Dogs with Childhood Cancer Patients and their Families Literature Review.** Pfizer Animal Health and American Humane Association: Denver

#### **Book Chapters, Invited Articles, and Reviews**

1. Wells, S. J., Anderson, T. L., Fluke, J. D., (1991). Screening and risk assessment in child protective services, in **Summary of Highlights-Fourth National Roundtable on CPS Risk Assessment,** Ed. Toshio Tatara, American Public Welfare Association, Washington, D. C.
2. Fluke, J. D. (1991). Risk Assessment and Workload Characteristics, in **Summary of Highlights-Fourth National Roundtable on CPS Risk Assessment,** Ed. Toshio Tatara, American Public Welfare Association, Washington, D.C.

3. Fluke, J. (1993). Some ways of thinking about outcome measurement, in **Summary of Proceedings; First National Roundtable on Outcome Measures in Child Welfare Services**, Ed. Nancy McDaniel, The American Humane Association: Englewood, CO.
4. Fluke, J., Wells, S., England, P., Walsh, W., English, D., Johnson W., Gamble, T., and Woods, L. (1994). **Evaluation of the Pennsylvania Approach to Risk Assessment**, in Seventh National Roundtable on CPS Risk Assessment, Summary of Highlights, Ed. Toshio Tatara. Washington, DC: APWA.
5. Fluke, J. Baumann, D., England, T., Kern, H., Law, R., McFadden, T., Schultz, F. (peer reviewed, 1995) **Emerging Critical conceptual Issues in Risk Assessment Research and Practice**, in Eighth National Roundtable on CPS Risk Assessment, Summary of Highlights, Ed. Toshio Tatara. Washington, DC: APWA.
6. Fluke, J., Graham, C., Baumann, D., Esterline J. (2001). **System Dynamics Simulation of Child Welfare Permanency Outcomes: an Application of the Children's Services Simulation Model (CSSM)**, In M. Hernandez and S. Hodges (Eds.), *Developing Outcome Strategies in Children's Mental Health* (pp. 183-201). Baltimore, MD: Paul H. Brookes Publishing Co.
7. English, D. Fluke, J.D. and Yuan, Y.T. (2003). **Alternative Response to Child Protective Services Investigations**. In N. Trocmé, D. Knoke, and C. Roy (Eds). *Community collaboration and differential response: Canadian and international research and emerging models of practice* (pp. 64 – 74). Ottawa, ON: Child Welfare League of Canada.
8. Fluke, J., Tonmyr, L., Bianchi, B., Gray, J., Halifax, J., Kim, C. (2008). Frameworks for international comparison of child maltreatment data. *World Perspectives on Child Abuse: 8<sup>th</sup> Edition*. Chicago: ISPCAN.
9. Fluke, J., Jones Harden, B., Jenkins, M., Ruehrdanz, A. (2012). A Research Synthesis on Child Welfare Disproportionality and Disparities. In *Disparities and Disproportionality in Child Welfare: Analysis of the Research*. Center for the Study Social Policy: Washington, DC: Center for the Study of Social Policy.
10. Baumann, D.J., Fluke, J.D., Dalglish, L., and Kern, K. (2014). The Decision Making Ecology. In A. Shlonsky and R. Benbenishty (Eds.). *From Evidence to Outcomes in Child Welfare: An International Reader* (pp. 24-40). New York, NY: Oxford University Press.
11. Casillas, K. and Fluke, J.D. (2014). The Case for a Needs-Based Model in Child Welfare: A Concept to Address Child Well-Being. In A. Shlonsky and R. Benbenishty (Eds.). *From Evidence to Outcomes in Child Welfare: An International Reader* (pp. 133-144). New York, NY: Oxford University Press.

12. Fluke, J.D., Baumann, D.J., Dalglish, L.I., and Kern, K. D. (2014). Decisions to Protect Children: A Decision Making Ecology. In J. Korbin and R. Krugman (Eds.). *Handbook of Child Maltreatment* (pp. 463-462). New York, NY: Springer.

## Other Publications

1. 1979-1988 Contributing Author, **National Study on Child Neglect and Abuse Reporting**, American Humane Association, Denver, Colorado.
2. Yomut Turkmen Bride Price and Marriage Preference Rules: (1980). **An Economic Selection Hypothesis with Demographic Controls**. Unpublished MA Thesis, Pennsylvania State University.
3. Bycer, A.M., Fluke, J.D., Costello, T., Schene, P., Breed, L., (1983). **Navy Family Advocacy Program: The Demographics of Family Violence on the Navy and Marine Corps**, American Humane Association, Denver, Colorado.
4. Trainor, C.M., De Panfilis, D., Fluke, J.D. (1983). **Child Abuse and Neglect Reporting and Disposition in the State of Virginia**, American Humane Association, Denver, Colorado.
5. Fluke, John, (1984). **Reports of Child Maltreatment by Medical Sources**, American Humane Association, Denver, Colorado.
6. Suski, L.B., Schene, P., Fluke, J.D., Costello, T., (1984). **Navy Family Advocacy Program: The Management and Utilization of Program Information**, American Humane Association, Denver, Colorado.
7. Interview with John Fluke. (1990). **Computer Use in Social Services Network**, 10(1), pp. 7-10.
8. Fluke, J., Cotton, E., Harper, C., Berdie, J., Salovitz, B., Edwards, M., Brittan, C., Groginski, L., (1996) **Illinois Child Endangerment Risk Assessment Protocol: A Report Concerning the Development and Testing of the Protocol**, Illinois Department of Children and Family Services.
9. Fluke, J. **Data Construction and Analytic Methods for Large Child Maltreatment Data Sets (2001)**. Paper and presentation for the Forum on the Canadian Incidence Study of Reported Child Abuse and Neglect (CIS) and the Étude sur l'incidence et les caractéristiques des situations d'abuse, de négligence, d'abandon, et de troubles de comportement sérieux signalées à la Direction de la protection de la jeunesse (DPJ) au Québec (EIQ). Val David, Québec.
10. U.S. Department of Health and Human Services. Administration for Children and Families/Children's Bureau and Office of the Assistant Secretary for Planning and Evaluation. [HHS/ACF and OASPE] **National Study Child Protective Services Systems and Reform Efforts: Review of**

**State CPS Policy.** (Washington, DC: U.S. Government Printing Office, 2003). (Contributing Author).

11. U.S. Department of Health and Human Services. Administration for Children and Families/Children's Bureau and Office of the Assistant Secretary for Planning and Evaluation. [HHS/ACF and OASPE] ***National Study Child Protective Services Systems and Reform Efforts: Findings on Local CPS Practices.*** (Washington, DC: U.S. Government Printing Office, 2003). (Contributing Author).
12. U.S. Department of Health and Human Services. Administration for Children and Families/Children's Bureau and Office of the Assistant Secretary for Planning and Evaluation. [HHS/ACF and OASPE] ***National Study Child Protective Services Systems and Reform Efforts: A Summary Report.*** (Washington, DC: U.S. Government Printing Office, 2003). (Contributing Author).
13. Shusterman, G., Fluke, J., Yuan, Y.T. (2005) **Male Perpetrators of Child Maltreatment: Findings from NCANDS** (Washington, DC: U.S. Department of Health and Human Services, Office of the Assistant Secretary for Planning and Evaluation).
14. Shusterman, G., Hollinshead, D., Fluke, J., Yuan, Y.T. (2005) **Alternative Responses to Child Maltreatment: Findings from NCANDS** (Washington, DC: U.S. Department of Health and Human Services, Office of the Assistant Secretary for Planning and Evaluation).
15. Fluke, J., Shusterman, G., Hollinshead, D., Yuan, Y.T. (2005) Rereporting and Recurrence of Child Maltreatment: Findings from NCANDS (Washington, DC: U.S. Department of Health and Human Services, Office of the Assistant Secretary for Planning and Evaluation).
16. Fluke, J. (2011). Decision making in child protection and child welfare: some considerations for information technology. CW360° Child Welfare and Technology. Spring, p 8 -9.
17. Fluke, J. (2012). [Review of the book Assistive Technologies and Other Supports for People with Brain Impairments, by M. J. Scherer], Journal of Technology in Human Services, 30(1) 57 – 58.

#### **Letters To The Editor (1):**

1. Gilbert, R., Fluke, J., O'Donnell, M., Gonzalez-Izquierdo, A., Brownell, M., Gulliver, P., Janson, S., & Sidebottom. (2012) Response to Lorraine Radford and colleagues and to David Finkelhor and Lisa Jones. Lancet. 379. 2049.

## **PRESENTATIONS (108):**

### **COMPETITIVE**

1. Fluke, J. (peer reviewed, 1985). Analysis of 1984 Child Abuse and Neglect Reporting Data, Seventh National Conference on Child Abuse and Neglect, Chicago, Illinois.
2. Fluke, J. (peer reviewed, 1986). Analysis of 1986 Child Abuse and Neglect Reporting Data. National Association for Welfare Research and Statistics, Richmond, Virginia.
3. Fluke, J. (peer reviewed, 1986). Reporting and Response to Child Abuse and Neglect. Seventh International Congress on Child Abuse and Neglect, Sydney, Australia.
4. Fluke, J. (peer reviewed, 1986). Is Child Abuse Increasing? 1986 Annual Meeting of the American Association for Protecting Children, Denver, Colorado.
5. Fluke, J. (peer reviewed, 1987). Prospects for the Application of Artificial Intelligence in Child Protective Services, First International Conference for Human Services Information Technology Applications, Birmingham, UK.
6. Fluke, J. (peer reviewed, 1988). Workload Analysis and Resource Management, Annual Meeting of National Association of Public Child Welfare Administrators, Washington, D.C.
7. Fluke, J. (peer reviewed, 1989). Workload Analysis and Resource Management in Child Protective Services, 8th National Conference on Child Abuse and Neglect, Salt Lake City, Utah.
8. Fluke, J. (peer reviewed, 1991). An Automated Model for Determining Costs of Child Protective Services, National Association for Welfare Research and Statistics, Charleston, South Carolina.
9. Fluke, J. (peer reviewed, 1991). Mini-Plenary-Toward a Shared Understanding: The Development and Use of Child Welfare Information; Reaffirming Our Roots-Ninth National Conference on Child Abuse and Neglect, Denver, Colorado.
10. Fluke, J. (peer reviewed, 1991). Optimizing Outcomes and Resources for Effective Child Protective Services, Reaffirming Our Roots-Ninth National Conference on Child Abuse and Neglect, Denver, Colorado.
11. Fluke, J., (peer reviewed, 1994), Modeling Children's Services, 10th International Congress on Child Abuse and Neglect, Kuala Lumpur, Malaysia.
12. Fluke, J. (peer reviewed, 1995). Application of Decision Support Technology in Child Welfare Services, Human Services Information Technology Applications-2, New Brunswick, New Jersey.

13. Fluke, J. (peer reviewed, 1995) Decision Support Systems, Tenth National Conference on Child Abuse and Neglect, Pittsburgh, Pennsylvania.
14. Fluke, J. (peer reviewed, 1995) Evaluation of the Pennsylvania Approach to Risk Assessment, Eighth Roundtable on CPS Risk Assessment, San Francisco, California.
15. Fluke, J., (peer reviewed, 1995) Organizational Development: Application in Child Welfare Services, Recipe for Excellence: Measuring Quality in Child Welfare Services, Keystone, Colorado.
16. Fluke, J., (peer reviewed, 1995) The Children's Services Simulation Model (CSSM). 30th Annual Meeting of the National Association of Child Welfare Research and Statics, Jackson Hole, Wyoming.
17. Fluke, J. & Yuan, Y.T., (peer reviewed, 1995) NCANDS: The National Child Abuse and Neglect Data System: state and national perspectives. APSAC fourth National Colloquium, Tucson, Arizona.
18. Fluke, J., (peer-reviewed, workshop organizer and panelist, 1996) National Child Maltreatment Data Collection and Analysis Systems: Perspectives from Four Countries. 11<sup>th</sup> International Congress on Child Abuse and Neglect, Dublin, Ireland.
19. Fluke, J., (peer reviewed, 1996) Family Decision Making and Community Based Social Work in the United States, 11<sup>th</sup> International Congress on Child Abuse and Neglect, Dublin, Ireland.
20. Fluke, J., (peer reviewed, 1996) Outcome Measures in Child Welfare Services. Eleventh National Conference on Child Abuse and Neglect, Washington, DC.
21. Fluke, J., (peer reviewed, 1997) Child Maltreatment Recurrence, 5th International Family Violence Research Conference, Durham, June, New Hampshire.
22. Fluke, J., (peer reviewed, 1997) Child Maltreatment Recurrence, 11th Roundtable on Child Protective Services Risk Assessment, July, San Francisco, CA.
23. Fluke, J., (peer reviewed, 1998) Enduring Issues in Using Administrative Data: Child Protection. Annual Meeting of The National Association for Welfare Research and Statistics, August, Chicago, IL.
24. Fluke, J., (peer reviewed, 1998) Promoting the Dialogue Between Local and National Data Systems. Sixth Annual Roundtable on Outcome Measure, April, San Antonio, TX.
25. Fluke, J., (peer reviewed, 1998) The Dynamics of Unsubstantiated Reports: A Multistate Study - Policy Review. The 12th International Congress on Child Abuse and Neglect, September, Auckland, New Zealand.

26. Fluke, J., (peer reviewed, 1998) The Dynamics of Unsubstantiated Reports: A Multistate Study - Policy Review. 12th National Conference on Child Abuse and Neglect, November, Cincinnati, OH.
27. Fluke, J., & Yuan, Y. T., (peer reviewed, 1999) Outcomes for Child Protective Services: Application and Prospects for the Use of NCANDS Data. Seventh Annual Roundtable on Outcome Measures in Child Welfare Services, San Antonio, TX.
28. Fluke, J., & Pope, D., (peer reviewed, 1999) The Impact of Family Preservation Services on Long-Term Out-of-Home Placement in Colorado. Seventh Annual Roundtable on Outcome Measures in Child Welfare Services, San Antonio, TX.
29. Fluke, J., (peer reviewed 2000) Child Welfare and Children's Services Simulation Workshop Context, Methods, Examples, and Prospects. Louis de la Parte Florida Mental Health Institute, University of South Florida, Tampa, Florida.
30. Fluke, J., (peer reviewed, 2000) The Dynamics of Unsubstantiated Reports: A Multistate Study – Worker and Supervisory Decision Making. 13th International Congress on Child Abuse and Neglect, September, Durban, South Africa.
31. Fluke, J., (peer reviewed, 2001) System Dynamics Simulation of Child Welfare Permanency Outcomes: An Application of Children's Services Simulation Model (CSSM). 13th International Congress on Child Abuse and Neglect, September, Durban, South Africa.
32. Fluke, J., & Gaudiosi, J., (peer reviewed, 2001) Future Directions For Child Abuse And Neglect Research, Annual Research Conference, Child Welfare League of America, June, Denver, Colorado.
33. Fluke, J., Gaudiosi, J., & Johnson, J., (peer reviewed, 2001) Reports, Victims, Maltreatments: What is the Difference? An Introduction to Understanding Child Maltreatment Statistics. 13th National Conference on Child Abuse and Neglect, April, Albuquerque, New Mexico.
34. Fluke, J., Parry, C. & Hollinshead, D., (peer reviewed, 2001) Dynamics of Unsubstantiated Reports of Child Abuse and Neglect. 13th National Conference on Child Abuse and Neglect, April, Albuquerque, New Mexico.
35. Fluke J., Parry, C. & Baumann, D., (peer reviewed, 2001) Dynamics of Unsubstantiated Reports of Child Abuse and Neglect. Annual Research Conference, Child Welfare League of America, June, Denver, Colorado.
36. Fluke, J., & Wulczyn, F., (peer reviewed, 2001) Forecasting and Monitoring Performance in Child Welfare and Children's Services Using Computer Simulation Context, Methods, Examples, and Prospects. Annual Research Conference: A System of Care for Children's Mental Health, Louis de la Parte Florida Mental Health Institute, February, Tampa, Florida.

37. Fluke, J., (peer reviewed,2002) Co-Presenter with Thomas Hay and John Gaudiosi, Recurrence of Maltreatment: Avoiding a Repeat of History. Children 2002: Making Children a National Priority, Child Welfare League of America, March, Washington, DC.
38. Fluke, J., (peer reviewed,2002) Charting Progress in Bridging the Gap Between Practice and Accountability: The Case of Recurrence of Maltreatment. 14<sup>th</sup> International Congress on Child Abuse and Neglect, International Society for the Prevention of Child Abuse and Neglect, Denver, CO.
39. Fluke, J., (peer reviewed,2002) Dynamics of Unsubstantiated Reports of Child Abuse and Neglect: A Decision-making Ecology. 14<sup>th</sup> International Congress on Child Abuse and Neglect, International Society for the Prevention of Child Abuse and Neglect, Denver, CO.
40. Fluke, J., (peer reviewed,2002) Using Technology for Charting Service Outcomes. 14<sup>th</sup> International Congress on Child Abuse and Neglect, International Society for the Prevention of Child Abuse and Neglect, Denver, CO.
41. Fluke, J., De Marco, R., Gray, J., Cawson, P., and Yuan, Y.Y. (peer reviewed,2002) Comparing National Incidence Data as a Means for Charting the Progress of Child Maltreatment Intervention Strategies. 14<sup>th</sup> International Congress on Child Abuse and Neglect, International Society for the Prevention of Child Abuse and Neglect, Denver, CO.
42. Fluke, J., Peddle NA, Yuan YY, Gaudiosi J and Edwards M (peer reviewed,2002) Charting the Evolution of a National Reporting System on Child Maltreatment: A Reflection of 25 Years of Progress. 14<sup>th</sup> International Congress on Child Abuse and Neglect, International Society for the Prevention of Child Abuse and Neglect, Denver, CO.
43. Cherna, M., Harrell, J., & Fluke, J.D. (peer reviewed, 2003). *From development to implementation: Using data to improve State and local prevention initiatives*. Paper presented at the 14<sup>th</sup> National Conference on Child Abuse and Neglect, St. Louis, MO.
44. Peddle, N.A., Yuan, Y.T., Gaudiosi, J., Edwards, M.T., & Fluke, J.D. (peer reviewed, 2003). The evolution of a National Reporting System on Child Maltreatment: 25 years of progress. Paper presented at the 14<sup>th</sup> National Conference on Child Abuse and Neglect, St. Louis, MO.
45. Radcliff, L., Sedlak, A., & Fluke, J.D. (peer reviewed, 2003). The National Study of CPS Systems and Reform Efforts: Results from the Local Agency Survey. Paper presented at the 14<sup>th</sup> National Conference on Child Abuse and Neglect, St. Louis, MO.
46. Schoech, D. Rycraft, J. Fluke, J.D. and Baumann, D. (peer reviewed 2003). Integrating IT, Research, and Performance Measurement: The DEMOS Project. Paper presented at the 2003 Tools That Work Conference, Child Welfare League of America, Miami, Florida.



47. Dalgleish, L., Hollows, A., Fluke, J., and Baumann, D., (peer reviewed, 2004) Steps to a Decision Making Ecology for Child Protective Services: A Multi-National Research Perspective. Presentation at the 15<sup>th</sup> International Congress on Child Abuse and Neglect, Brisbane, Australia.
48. Fluke, J., Yuan, Y.T., and Gaudiosi, J., (peer reviewed, 2004) The National Child Abuse and Neglect Data System. Presentation at the 15<sup>th</sup> International Congress on Child Abuse and Neglect, Brisbane, Australia.
49. Gaudiosi, J., Fluke, J.D., Edwards, M., Needell, B., and Sermons, M.W. (peer reviewed, 2004). NCANDS in-depth: lessons for program improvement. Presentation at the 2004 Annual Conference of the National Resource Center for Information Technology in Child Welfare, Crystal City, Virginia.
50. Schoech, D., Farris, J., Fluke, J.D. , and Wittenstrom, K. (peer reviewed, 2004). Putting data where it counts: deploying child welfare data through OLAP and data warehouse technology. Presentation at the 2004 Annual Conference of the National Resource Center for Information Technology in Child Welfare, Crystal City, Virginia.
51. Gaudiosi, J., Fluke, J.D., Needell, B., and Wolczyn, F., (peer reviewed, 2005) NCANDS in-depth: Lessons on Outcomes. Presentation at the 15<sup>th</sup> National Conference on Child Abuse and Neglect, Boston, MA.
52. Fluke, J. (peer reviewed, 2006) Mettre à Jour du US National Child Abuse and Neglect Data System (NCANDS): Tendances et Comparaisons. Presentation at the 74<sup>th</sup> Association francophone pour la savior (ACFAS), Montreal, Quebec, Canada.
53. Fluke, J. (peer reviewed, 2006). Symposium on International Child Maltreatment Data Collection Programs: Context and Perspectives, The National Child Abuse and Neglect Data System. XVIth ISPCAN International Congress on Child Abuse and Neglect, York, England, UK.
54. Fluke, J., Shusterman, G., Hollinshead, D., Yuan, Y.T. (peer reviewed, 2006) Rereporting and Recurrence of Child Maltreatment: Findings from NCANDS. Presentation at the 19th Annual Research Conference on Children's Mental Health - A System of Care for Children's Mental Health: Expanding the Research Base, Tampa, FL.
55. Fluke, J.D., Parry C. F., Baumann D., Sheets J., Wittenstrom K., Jeffries V. (peer reviewed, 2006). Symposium on Multi-National Research Applications of the Decision Making Ecology (DME) and General Assessment and Decision Making (GADM) models to the Issue of Racial and Ethnic Overrepresentation of Protective Services: Modeling Decision Factors in the US. XVIth ISPCAN International Congress on Child Abuse and Neglect, York, England, UK.
56. Fluke, J.D., Yuan, Y. T., Gaudiosi, J., (peer reviewed, 2007). Child Neglect – An Overview of Incidence, Reporting and Child Characteristics. 20th National Research Conference, Research &

Training Center for Children's Mental Health, USF - Florida Mental Health Institute Tampa, Florida

57. Baumann, D., Capouch, D., Fluke, J., and Ortiz, M. (peer reviewed, 2008) Unlocking Disparities: Provider and Community Perspectives. 21st National Research Conference, Research & Training Center for Children's Mental Health, USF - Florida Mental Health Institute, Tampa, Florida.
58. Fluke, J., Tonmyr, L. (peer reviewed, 2008) International Child Maltreatment Data Collection Programs: Context and Perspectives. XVIIth ISPCAN International Congress on Child Abuse and Neglect, Hong Kong, China.
59. Fluke, J., Dalglish, L., Baumann, D., Wulczyn, F. & Steffen, C. (peer reviewed, 2009) Risk Assessment Is Not All There Is: Child Maltreatment Decision Making. 17th National Conference on Child Abuse and Neglect, April 2, Atlanta, USA.
60. James, J., Hargett, B., Fluke, J., Parrish, D., Deserly, K., Miller, O. (peer reviewed workshop, 2009) Achieving Service Equity, A Forum on Using Research and Promoting Practice to Address Disproportionality. 17th National Conference on Child Abuse and Neglect, April 1, Atlanta, USA.
61. Gray, J., Fluke, J., Tonmyr, L. (peer reviewed, 2009) The International Society for the Prevention on Child Abuse and Neglect (ISPCAN) Working Group on Child Maltreatment Data Collection. Congress of the British Association for the Prevention of Child Abuse and Neglect, September 15. Swansea, Wales, UK.
62. Gray, J., Fluke, J., Mansell, J., Madrid, B., Valentine, K., Van Puyenbroeck, B. & Graham, D. (peer reviewed, 2009) International Child Maltreatment Data Collection Programs: Context, Perspectives, and Prospects for Development. 8<sup>th</sup> ISPCAN Asian Pacific Regional Conference and Australasian Conference, November 17. Perth, WA, Australia.
63. Casillas, K., Fluke, J., Cappa, C. (peer reviewed, 2010) The multiple indicator cluster survey (MICS) of households: cross-national surveillance system to address disciplinary practices. International Family Violence and Child Victimization Research Conference, July 13, Portsmouth, NH.
64. Fluke, J. & Durning, P., (symposium peer reviewed, 2010) Risk Assessment Is Not All There Is: Child Maltreatment Decision Making: Translating Science into Service XIIIe Congrès international Education familiale et services pour l'enfance (AIFREF), 17-19 novembre 2010, Firenze, IT.
65. Gray, J., Fluke, J., Mansell, J., Madrid, B., Valentine, K., Van Puyenbroeck, B. & Graham, D. (peer reviewed, 2010) International Child Maltreatment Data Collection Programs: Context, Perspectives, and Prospects for Development. 18<sup>th</sup> ISPCAN Congress, September 26. Honolulu, HI.

66. Fluke, J., Casillas, K., & Cappa, C., (peer reviewed, 2011) Child Disciplinary Practices: Results from the MICS3. 9<sup>th</sup> ISPCAN Asia Pacific Conference on Child Abuse & Neglect, October 7, 2011, Delhi, India
67. Fluke, J., Dalton, E., Needell, B., Wulczyn, F., Courtney, E., Baumann, D., (peer reviewed, 2011) Taking research to practice: rethinking outcomes and performance measures for the child and family service reviews. Society for Social Work Research Annual Conference, Tampa, FL.
68. Fluke, J., & Casillas, K., (peer reviewed, 2011) Child Welfare & Children's Mental Health: Using Nationally Representative Data to Identify the Overlap. 24<sup>th</sup> Annual Children's Mental Health Research and Policy Conference, March 20, 2011, Tampa, Florida.
69. Dettlaff, A., Baumann, D., Graham, J. C., Fluke, J. (peer reviewed 2012). Factors that Influence the Removal Decision in Child Protective Services: Development of an Instrument to Understand the Decision-Making Process. 2012 Society for Social Work Research Conference, January 13, Washington, DC.
70. Gilbert, R., Fluke, J., O'Donnell, M., Gonzalez-Izquierdo, A., Brownell, M., Gulliver, P., Janson, S., & Sidebottom. (Fluke presenter, peer reviewed, 2012). Trends in child maltreatment in six developed countries. Society for Social Work and Research: Sixteenth Annual Conference Research That Makes A Difference: Advancing Practice and Shaping Public Policy, January 12, Washington, DC.
71. Dettlaff, A. Graham, J. C., Baumann, D., Fluke, J. (peer reviewed 2012). Factors That Influence the Removal Decision In Child Protective Services: Development of An Instrument to Understand the Decision-Making Process. Society for Social Work and Research: Sixteenth Annual Conference Research That Makes A Difference: Advancing Practice and Shaping Public Policy, January 13, Washington, DC.
72. Fluke, J. (peer reviewed 2012). Racial/Ethnic Disparities in the Child Welfare System: Decision Making. The 26th Annual San Diego International Conference on Child and Family Maltreatment, January 26, San Diego, CA.
73. Fluke, J., Baumann, D. J. and Detlaff, A. (Fluke & Detlaff, presenters peer reviewed, 2012). Threshold Shift: Applications of the Decision-Making Ecology. 18<sup>th</sup> National Conference on Child Abuse and Neglect, April 20, Washington, DC.
74. Fluke, J., Gilbert, R., O'Donnell, M., Gonzalez-Izquierdo, A., Brownell, M., Gulliver, P., Janson, S., & Sidebottom. Fluke, J. (peer reviewed 2012 and symposium organizer). Child maltreatment: variation in trends and policies in six developed countries. International Family Violence and Child Victimization Research Conference, Portsmouth, NH.
75. Fluke, J. & Durning P. (Symposium organizers, peer reviewed, 2012). An Ecology of Decisions: Child Maltreatment and Child Welfare Decision Making, 12th European Scientific Association on

Residential & Foster Care for Children and Adolescents, Glasgow, Scotland, September 6.

76. Graham, J. C., Fluke, J., Baumann, D. J. and Detlaff, A. (Fluke presenter, 2012). The Decision Making Ecology of Placing a Child into Foster Care: A Structural Equation Model. 12th European Scientific Association on Residential & Foster Care for Children and Adolescents, Glasgow, Scotland, September 6.
77. Gilbert, R., Fluke, J., O'Donnell, M., Gonzalez-Izquierdo, A., Brownell, M., Gulliver, P., Janson, S., & Sidebottom. (Fluke presenter, peer reviewed, 2012). Trends in child maltreatment in six developed countries. 12th European Scientific Association on Residential & Foster Care for Children and Adolescents, Glasgow, Scotland, September 7.
78. Fluke, J. (Fluke presenter and chair, peer reviewed, 2013). Overview and Preliminary Findings from the Evaluation of the National Quality Improvement Center on Differential Response in Child Protective Services. 26<sup>th</sup> Annual Children's Mental Health Research and Policy Conference, March 5, 2013, Tampa, Florida.
79. Rinehart, R., Maholme, V., Eunice, Ager, A. & Fluke, J. (Ager & Fluke presenter, peer reviewed 2013). U.S. Government Action Plan on Children in Adversity Strategic framework for international assistance 2012 – 2017. ISPCAN European Regional Conference, Dublin, Ireland, 17th September.
80. Fluke, J., Merkel-Holguin, L., Hahn, A. & Runyan, D. (Fluke, Merkel-Holguin, Hahn & Runyan presenters, peer reviewed 2013). Differential Response: Looking at this child welfare reform from an evidence and rights-based perspective. ISPCAN European Regional Conference, Dublin, Ireland, 17th September.
81. Darnell, A & Fluke, J. (Darnell & Fluke presenter, peer reviewed, 2013). Optimizing Differential Response Thresholds in Child Protection: How Much Is Enough? 8<sup>th</sup> Annual Conference on Differential Response, October 22-25, Vail, CO
82. Darnell, A & Fluke, J. (Darnell & Fluke presenter, peer reviewed, 2014). Optimizing Differential Response Thresholds in Child Protection: How Much Is Enough? Society for Social Work and Research: Eighteenth Annual Conference Research for Social Change, January 16, San Antonio, TX.

## **NON-COMPETITIVE**

1. Fluke, J. (Organizer, 1981). Aggregation and Compatibility of Social Service Data. First National Conference for Family Violence Researchers, Durham, New Hampshire.
2. Fluke, J. (Organizer, 1984). Policy research in Child Protective Services. Second National Conference for Family Violence Researchers at the University of New Hampshire.

3. Fluke, J. (Organizer, 1984). **Working Conference on Child Protective Services Policy** in conjunction with the 1984 Annual Meeting of the American Association for Protecting Children, Anaheim, California.
4. Fluke, J. (1987). Various Topics, 1987 Annual Meeting of the American Association for Protecting Children, Austin, Texas.
5. Fluke, J. (1988). **Various Topics**, 1988 Annual Meeting of the American Association for Protecting Children, Tacoma, Washington.
6. Fluke, J., (invited, 1995) The Status of Child Welfare Data. Meeting of the Child Protection Study Group, The Institute for Families in Society, University of South Carolina, Wild Dunes, South Carolina.
7. Fluke, J., (Mini-Plenary Organizer and Presenter, (1996) Weaving the Future of Research and Evaluation: the Need to Know, Eleventh National Conference on Child Abuse and Neglect, Washington, DC.
8. Fluke, J., (convener and Instructor, 1997) Seminar on the Utilization Computer Simulation in Child Protective and Child Welfare Services, Chapin Hall Center for Child and Families, University of Chicago, July, Chicago, IL.
9. Fluke, J., (invited, 1997) Status of the National Child Abuse and Neglect Data System, National Child Welfare Conference, Washington, DC.
10. Fluke, J., (invited, 1997) Subsidized Guardianship: Simulation Model Use and Considerations, Kinship Care: A Natural Bridge, August, San Francisco, CA.
11. Fluke, J., (invited, 1998) Using Administrative Data to Measure Child Welfare Outcomes. Administrative Data In Child Welfare: Research Strategies And Prospects For The Future, June, Cornell University, Ithaca, NY.
12. Fluke, J., (presenter and organizer, 2001), Symposium on the Use of Administrative Data in Child Welfare Research and Evaluation. Annual Research Conference: A System of Care for Children's Mental Health, Louis de la Parte Florida Mental Health Institute, February, Tampa Florida.
13. Fluke, J.D. (invited, 2002). Disproportionate representation of race and ethnicity in child maltreatment. Paper presented at the Children's Bureau Research Roundtable on Children of Color in Child Welfare, Washington, DC.
14. Fluke, J.D. (invited, 2003). Overview of differential response models in the United States: Results from the Study of CPS Systems and Reform Efforts. Paper presented at the 4th National Child

Welfare Symposium: Community Collaboration and Differential Response, Banff, Alberta, Canada.

15. Fluke, J. D., (invited, 2004) Managing the Risk of Harm to Children, presentation to the meeting “Keeping Children Safe: The Child Protection System Challenge?” Wingspread Conference November 10-12, 2004
16. Fluke, J.D., (invited, 2007). The National Child Abuse and Neglect Data System (NCANDS): development and utility of an existing system for collecting data and monitoring child abuse in the US. EUROPEAN SEMINAR ON MONITORING SYSTEMS OF CHILD ABUSE Child abuse: which kind of data for monitoring? 18 January 2007, Istituto degli Innocenti, Florence, Italy.
17. Fluke, J. (invited, 2009) Outcomes in the Long Run: Ingredients for Children’s Protection and Welfare Outcomes Programs. The Second Canadian Roundtable on Child Welfare Outcomes Center for Research on Children and Families, 8 – 9 October, 2009. Centres of Excellence for Children’s Well-Being: Child Welfare, Montreal, Canada.
18. Fluke, J., (invited, 2010) Safety outcomes and safety decision policy: NCANDS and administrative data capacity, limitations, and prospects. Partners for Our Children, November 2, Tacoma, WA
19. Fluke, J. (invited, 2011). Focal Question 3: Effective sustainable long-term care and protection of children with a history of living outside of family care: Presentation of the Evidence. U.S. Government Evidence Summit: Protecting Children Outside of Family Care, December 13, Washington, DC.
20. Fluke, J. (invited, 2011). Child Maltreatment Fatalities: Purpose, Measurement, Analysis, Decisions. Child Safety Forum, Casey Family Programs, November 10, Washington, DC.
21. Fluke, J., (invited, 2011). Child Protection and Systems of Intervention: Perspectives on Cross System Data Comparison. CIS-2008 Provincial / First Nations Research Network Workshop, October 21, 2011, Toronto, Canada.
22. Fluke, J., (invited, 2011) Indicators and the protection of children victims of exploitation and violence. Stakeholders Meeting “Applying the European Union Agency for Fundamental Rights Indicators on the Rights of the Child: Policy Priorities for Data Collection.” European Union Agency for Fundamental Rights, February 22-23, Vienna, Austria.
23. Fluke, J., (invited, 2011) Research synthesis on child welfare disproportionality and disparities: child welfare entries. Race & Child Welfare: Disproportionality, Disparity, Discrimination: Re-Assessing the Facts, Re-Thinking the Policy Options -Working Conference, January 28-29, Harvard Law School, Cambridge, MA.
24. Fluke, J. (invited 2012). A cross-national view of child protective systems. Child Maltreatment Research, Policy and Practice for the Next Generation: A Workshop Convened by the Board on

Children, Youth, and Families, Institute of Medicine and National Research Council of the National Academy of Sciences, January 31, Washington, DC.

25. Costello, T., Fluke, J., Casillas, K., Baumann, D., Fuller, T., Freitag, R., Edwards, M. (invited 2012). Decision Making in Child Welfare: A Discussion of Tools, Influences, Outcomes, and Research. 18<sup>th</sup> National Conference on Child Abuse and Neglect, April 18, Washington, DC.
26. Fluke, J. (invited 2012). Steps to a Decision Making Ecology: Implications for Child Welfare Prevention and Intervention. 2012 Council on Contemporary Families Annual Conference, April 27, Chicago, IL.
27. Fluke, J. (invited 2013). Decisions and Disparities: Disentangling Sources of Inequity. Shubert Center for Child Studies, Case Western Reserve University, February 7, Cleveland, OH.
28. Fluke, J. (invited 2013). Decision Making Ecology: The Continuum of Child Welfare Decisions. Decision-making on child care symposium: From A to Z in decision-making in child care, Groningen, Netherlands, 20th September 2013.
29. Fluke, J. (invited 2013). Rethinking the Functioning of Child Protective Services. “On the Frontline” Initiative Meeting, Annie E. Casey Foundation, Baltimore 15 October, 2013.
30. Fluke, J. (invited 2014). Perspectives on Risk and Integrated Data in Decision Making Contexts: Child Maltreatment Surveillance, Prevention, and Intervention. Expert Meeting Frontiers of Risk Epidemiology in Early Childhood, German Youth Institute, Munich, Germany, January 29<sup>th</sup>, 2014.
31. Fluke, J. (invited 2014). Lifespan Data Linkage and Integration: Benefits for Preventing Harm to Children. *National Family Safety Program, National Guard Health Affairs, Riyadh, KSA*, February 18, 2014
32. Fluke, J. (invited 2014). A Critical Reflection on Decision Making Contexts and the Potential Role of Predictive Risk Models. Advancing the Science of Children’s Services Through Large Data, University of Southern California, School of Social Work, Los Angeles, CA, February 28, 2014.
33. Fluke, J. (invited 2014). Decision Making Ecology and Applications. Decision Making Seminar, Haruv Institute, Hebrew University, Jerusalem, Israel, 3 March, 2014

## **PEER REVIEWED PUBLICATIONS IN REVIEW (1):**

1. Darnell, A., Fluke, J., Casillas, K., Rudlang-Perman, K., and Guterman, K. (in review). Exploring Risk Thresholds for the Alternative Response Track in Differential Response Systems: A County-Level Analysis of Utilization of the Alternative Response Track and Re-Reporting Rates. *Child Abuse & Neglect*.

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## CURRICULUM VITAE

### EDUCATION

- Ph.D.**, 2012      Social Policy, Children, Youth, and Families Policy concentration.  
Heller School of Social Policy and Management, Brandeis University, Waltham, MA.
- Dissertation: *Do Outcomes Reflect Performance, Demographic Dividends, or Policy Artifacts? A Study of the Effects of Child Welfare Policies, Practices, and Demographics on State Child Maltreatment Recurrence Rates.*  
Committee: Jeffrey Prottas (Chair), John Fluke, Andrew Hahn, and Natalia Sarkisian
- 2002-2003: Recipient of the Sol Chaikin Fellowship.  
2003-2004: Recipient of the Shapiro Fellowship.  
2004: Teacher's Assistant for Professor Anita Hill's course on Race and the Law.
- M.P.A.**, 1995      Policy Analysis and Program Evaluation emphasis, Child and Family Studies concentration.  
Trachtenburg School of Public Policy and Public Administration, George Washington University, Washington, D.C.
- M.A.**, 1995      Public Policy, Women's Studies concentration.  
George Washington University, Washington, D.C.
- B.A.**, 1989      Psychology.  
Colby College, Waterville, ME.

### SKILL SUMMARY

- Extensive child welfare research, program evaluation, and policy analysis experience utilizing advanced quantitative and qualitative data collection, analysis, report writing, and project management skills.
- Insight into federal, state, and local perspectives on child welfare programs, policies, practices, administrative data, performance measurement, program improvement, and system reform efforts.
- Demonstrated presentation, training, technical assistance, publication, grant writing and grant reviewing experience.

### PROFESSIONAL EXPERIENCE

**Assistant Research Professor**, July 2013 – present

Kempe Center for the Prevention and Treatment of Child Abuse and Neglect, Denver, CO.

**Child and Family Services Review and Title IV-E Review Consultant Reviewer**, August 2002 – August 2008

Johnson, Bassin & Shaw, Silver Spring, MD.

**Child Welfare Program Specialist**, January 2001 - August 2002

United States Department of Health and Human Services, Administration for Children and Families, Boston, MA.

**Senior Research, Program, and Policy Analyst**, September 2000 - December 2000

**Program, Policy, and Research Analyst**, September 1997 - August 2000.

American Humane Association, Children's Division, Englewood, CO.

**Research and Policy Associate**, April 1996 - August 1997

Center for the Study of Social Policy, Washington, DC.

**Research Assistant Intern**, October 1994 - April 1996

Child Welfare League of America, Washington, DC.



## **PRIMARY RESEARCH INTERESTS**

- Child protective services research, policy analysis, program evaluation, and system reform efforts.
- Influence of policies, practices, and demographics on child welfare decisions and outcome measures.

## **PEER REVIEWED JOURNAL ARTICLE**

Fluke, J., Shusterman, G., **Hollinshead, D.**, & Yuan, Y.Y. (2008). Longitudinal Analysis of Repeated Child Abuse Reporting and Victimization: Multistate Analysis of Associated Factors, *Child Maltreatment*, 13, 76-88.

## **BOOK CHAPTER**

**Hollinshead, D.**, & Fluke, J. (2001). What Works in Safety and Risk Assessment for Child Protective Services. In M. Kluger, G. Alexander & P. Curtis (Eds.), *What Works in Child Welfare*. (67-92). Washington, DC: CWLA.

## **MONOGRAPHS AND TECHNICAL REPORTS**

National Quality Improvement Center on Differential Response in Child Protective Services. (2014). *Final report: QIC-DR cross-site evaluation*. (Contributing Author)

Fluke, J., Shusterman, G., **Hollinshead, D.**, & Yuan, Y.Y. (2005). *Longitudinal Analysis of Repeated Child Abuse Reporting and Victimization: Issue Brief #3*. Washington, DC: United States Department of Health and Human Services (US DHHS), Office of the Assistant Secretary for Planning and Evaluation (OASPE).

Shusterman, G., Fluke, J., **Hollinshead, D.**, & Yuan, Y.Y. (2005). *Alternative Responses to Child Maltreatment: Findings from NCANDS: Issue Brief #2*. Washington, DC: US DHHS, OASPE.

Fluke, J., & **Hollinshead, D.** (2003). *Child Maltreatment Recurrence*. Duluth, GA: US DHHS National Resource Center on Child Maltreatment.

Fluke, J., Parry, C., Shapiro, P., **Hollinshead, D.**, & Bollenbacher, V. (2002, September). The Case on Unsubstantiated. *Policy & Practice*. Washington, DC: APHSA.

Fluke, J., Parry, C., Shapiro, P., **Hollinshead, D.**, Bollenbacher, V., Baumann, D., & Davis-Brown, K. (2001). *Dynamics of Unsubstantiated Reports of Child Abuse and Neglect: A Multi-State Study*. Englewood, CO: American Humane Association, American Public Human Services Association, and Walter R. McDonald and Associates.

American Humane Association. (2000). *Assessment of the District of Columbia Bifurcated Intake and Investigation System*. Englewood, CO: AHA. (Primary Author)

American Humane Association and Walter R. McDonald and Associates. (2000). *California Department of Social Services S.B. 2030 Child Welfare Services Workload Study*. Englewood, CO: AHA. (Contributing Author)

American Humane Association. (1999). *Developing and Implementing an Outcome-Based Performance Monitoring System for Child Welfare Services in Iowa: Final Report*. Englewood, CO: AHA. (Contributing Author)

American Humane Association. (1998). *Developing and Implementing an Outcome-Based Performance Monitoring System for Child Welfare Services in Iowa: Results of the Evaluability Assessment*. Englewood, CO: AHA. (Primary Author)

American Humane Association. (1998). The Research Basis for Risk Assessment. In *Idaho Family and Children Services Risk Assessment Training Handbook*. Englewood, CO: AHA. (Primary Author)

American Humane Association, University of Southern Maine Muskie Institute, and Child Welfare Policy and Practice Group. (1998). *A Comprehensive Review of the Cuyahoga County Department of Children and Family Services*. Englewood, CO: AHA. (Contributing Author)

Center for the Study of Social Policy. (1997). *1996 Assessment of the Progress of the Arkansas DHS/DCFS in Meeting the Requirements of the Angela R. Settlement Agreement, Volume I: Case Record Review and Volume II: Site Visit Report*. Washington, DC: CSSP. (Contributing Author)

**Hollinshead, D.** (Ed.) (1997, Spring). *SafeKeeping: A Newsletter for the Edna McConnell Clark Foundation's Community Partnerships for Protecting Children*. Washington, DC: CSSP.

Center for the Study of Social Policy. (1996). *Profiles of Missouri's Community Partnerships and Caring Communities*. Washington, DC: CSSP. (Contributing Author)

### **PRESENTATIONS AND TRAINING**

**Hollinshead, D.** (2007). *The Ecology of Child Maltreatment Recurrence: A Study of Relationships between Policies, Practices, Demographics and Outcomes*. Presentation at the 16<sup>th</sup> National Conference of Child Abuse and Neglect, Portland, OR.

Fluke, J., & **Hollinshead, D.** (2003). *What Do We Know About Child Maltreatment Recurrence?* Presentation at the 14<sup>th</sup> National Conference on Child Abuse and Neglect, St. Louis, MO.

**Hollinshead, D.**, Melendez V., & Munro, J. (2002). *The Role of the Courts in Supporting State Adherence to Title IV-E and IV-B Laws and Regulations*. Presentation at the Maine District Court Judge's Conference, Sunday River, ME.

Fluke, J., Parry, C., & **Hollinshead, D.** (2001). *Dynamics of Unsubstantiated Reports of Child Maltreatment*. Presentation at the 13<sup>th</sup> National Conference of Child Abuse and Neglect, Albuquerque, N.M.

Melendez, V., & **Hollinshead, D.** (2001). *ASFA and the Child and Family Services Reviews*. Presentation to the Maine State Legislative Standing Committee on Health and Human Services, Augusta, ME.

Squadrito, E., Melendez, V., Dobbyn, B., **Hollinshead, D.**, & Munro, J. (2001). *Preparing to Conduct the CFSR Onsite Review*. Presentation at the Massachusetts CFSR State Team Training.

**Hollinshead, D.** (2000). *History and Overview of Risk and Safety Assessment*. Presentation at the 14<sup>th</sup> National Roundtable on CPS Risk Assessment, San Francisco, CA.

Parry, C., & **Hollinshead, D.** (2000). *The Dynamics of Unsubstantiated Reports: Policy Related to Safety and Risk*. Presentation at the 14<sup>th</sup> National Roundtable on Risk Assessment, San Francisco, CA.

Berdie, J., Alexander, S., Salovitz, B., & **Hollinshead, D.** (2000). *Idaho Risk Assessment: Cross-State On Site Training*.

McDaniel, N., & **Hollinshead, D.** (1998). *The Adoption and Safe Families Act and the Proposed Child and Family Services Program Reviews*. Presentation at the 12<sup>th</sup> National Conference on Child Abuse and Neglect, Cincinnati, OH.

### **POLICY ANALYSES AND ADVOCACY EFFORTS**

American Humane Association. (1999). *Comments on the Proposed Adoption and Safe Families Act Outcome Measures*. Englewood, CO: AHA. (Primary Author)

American Humane Association. (1998). *Comments on the Proposed Regulations for the Child and Family Services Reviews*. Englewood, CO: AHA. (Primary Author)

American Humane Association. (1998). *Comments on the Proposed Regulations for the Adoption and Safe Families Act*. Englewood, CO: AHA. (Primary Author)

**Hollinshead, D.** (1998). Alcohol and Other Drug Abuse and the Termination of Parental Rights: A Challenge for Implementation of the Adoption and Safe Families Act of 1997. *Protecting Children*, 14(3), 15-20.

**Hollinshead, D.** (1998). Domestic Violence and ASFA: Preventing the Double Victimization of Abused Mothers. *Protecting Children*, 14(3), 19.

### **CHILD WELFARE RESEARCH, PROGRAM EVALUATION, POLICY ANALYSIS, AND TRAINING PROJECTS**

#### **Kempe Center for the Prevention and Treatment of Child Abuse and Neglect**

- ***Quality Improvement Center on Differential Response in Child Protective Services Cross-Site Evaluation.*** Conducted data analysis and edited and wrote reports for a project examining the processes and outcomes of a randomized control study of three sites' differential response programs.
- ***No Place Like Home Family Group Decision Making Evaluation.*** Conducted data analysis and edited and wrote reports for a project examining the processes and outcomes of a mixed methods study regarding the implementation, utilization and comparative outcomes in three sites employing family group decision making.
- ***Saudi Arabia Project.*** Conducting data analysis to examine the association between adverse childhood experience and long-term health outcomes using ACES survey data collected across Saudi Arabia.

#### **US DHHS Administration for Children and Families Program Reviews:**

- ***Child and Family Services Reviews.*** Served as a site co-lead, federal reviewer, or consultant reviewer on 10 CFSRs.
- ***Title IV-E Eligibility Reviews.*** Served as a federal or consultant reviewer on four IV-E reviews.
- ***Adoption and Foster Care Analysis and Reporting System (AFCARS) Reviews.*** Served as federal reviewer on three AFCARS reviews.
- ***State Automated Child Welfare Information System (SACWIS) Reviews.*** Served as federal reviewer on one SACWIS review.

#### **American Humane Association projects:**

- ***Assessment of the District of Columbia Bifurcated Intake and Investigation System. Project Manager.*** Managed an assessment of the feasibility of unifying intake and investigation responsibilities. Reviewed policies and evaluated cooperative agreement between the District of Columbia Metropolitan Police Department and the D.C. Child and Family Services Agency (CFSA). Created interview and focus group protocols, analyzed data, monitored project budget, and functioned as principal liaison between AHA, project consultants and the client. Conducted data analysis using multiple quantitative and qualitative data sources. Conducted comparative analysis of alternative models of intake and investigation for CFSA. Synthesized

information from all sources to develop recommendations, write and edit final report.

- ***Dynamics of Unsubstantiated Reports of Child Abuse and Neglect.*** Reviewed state policies, revised and implemented analytic plan, synthesized national administrative data (NCANDS Summary Data Component (SDC), and Detailed Case Data Component (DCDC) data) with policy review data, coded and conducted quantitative and qualitative data analysis for a Federally-funded 50 state study which aimed to explain variance in unsubstantiation disposition rates across the states. Wrote and edited final policy analysis report. Assisted with project planning and management.
- ***California Department of Social Services Workload Study.*** Conducted focus groups to develop workload time study codes and definitions, define work parameters for special county initiatives, and to set minimal and optimal standards for child welfare staff workloads for a study aimed at updating the State's child welfare services budgeting methodology. Developed training materials and coordinated logistics for statewide data collection train-the-trainers training, involving over 500 staff across the State. Provided technical assistance to study participants, analyzed qualitative data, synthesized findings, drafted report recommendations, and co-wrote and edited final report.
- ***Comprehensive Review of the Cuyahoga County, Ohio Department of Children and Family Services.*** Developed, pilot-tested, and trained reviewers on case record review (CRR) instrument and process which was part of a comprehensive child welfare system performance review. Conducted CRR and lead CRR quality assurance effort. Conducted interviews, focus groups, and other data analysis using multiple quantitative and qualitative data sources, synthesized findings and generated program and system reform recommendations, co-wrote and edited final report.
- ***National Child Abuse and Neglect Data System (NCANDS), Technical Team Member.*** Assisted with the provision of technical assistance to the Administration for Children and Families' Region IV states in validating, clarifying, and interpreting their SDC and/or DCDC data, which are voluntarily submitted by states to the Federal government and reflect child protective services' intake, investigation and other related data. Analyzed and prepared data and edited state comments for publication in *Child Maltreatment 1999*.
- ***Arizona Administration of Children and Family Services Workload Study.*** Co-developed workload study template, provided technical assistance to study participants, conducted quantitative data analysis, and prepared reports for a statewide study of child welfare staff workloads. Co-wrote final report.
- ***Hennepin County, MN, Child Welfare System Reform Evaluability Assessment. Project Manager.*** Created protocols for and conducted focus groups and interviews to identify program and policy issues of concern and determine the feasibility of and plans for further evaluation for a project aimed at assessing agency performance and developing recommendations for system and program reform. Synthesized, analyzed and reported findings to develop framework for subsequent program evaluation.
- ***Iowa Division of Children and Family Services Outcome-Based Performance Monitoring System Project.*** Co-facilitated focus group charged with identifying and selecting outcome measures in a project that developed a statewide, outcome-based, performance monitoring system. Wrote project reports.
- ***Idaho Risk and Safety Assessment Training.*** Conducted literature review on the empirical basis for safety and risk assessment and individual risk and safety factors, assisted in the development of standardized State risk and safety assessment instruments, contributed to development and revision of training curricula, and delivered pilot and roll-out training to social workers and supervisors across the state.
- ***AHA Roundtables.*** Assisted in the development of national roundtable themes and agendas. Reviewed

presentation abstracts, selected speakers, facilitated workshops for, and delivered presentations at AHA's Outcome Measures, Risk Assessment, and ASFA Roundtables.

- ***AHA ASFA and CFSR Advocacy efforts.*** Spearheaded agency ASFA and CFSR advocacy initiative. Authored agency position papers on the proposed ASFA regulations, outcome measures, and CFSRs. Authored articles about the potential impact of ASFA on both substance abuse and domestic violence-affected families in the child welfare system. Facilitated ASFA roundtable workshops. Co-facilitated a think tank on ASFA and the CFSR at the 12<sup>th</sup> National Conference on Child Abuse and Neglect.

#### **Center for the Study of Social Policy Projects:**

- ***Arkansas Division of Child and Family Services Case Record Review and Site Visits.*** Reviewed and co-supervised review of a representative, stratified sample of child welfare services case records to assess staff and system performance. Conducted interviews of and focus groups with child welfare and privatized CPS system personnel. Cleaned and analyzed quantitative data on over 1,200 cases from across the state. Wrote and edited reports.
- ***District of Columbia Department of Children and Family Services Child Fatality Review.*** Reviewed child fatality case records to identify practice concerns and assess staff compliance with child fatality review protocols. Identified strengths of and challenges to system performance.
- ***Community-Based Child Protective Services Evaluation Workgroup.*** Conducted literature review and guided workgroup discussion regarding options for inter- and intra-site evaluations of a four-state, community-based, foundation-supported child protective services initiative.
- ***Missouri Caring Communities Case Study.*** Created interview protocols and conducted interviews of program personnel and community members for an assessment of a school-linked community services initiative spanning the state.
- ***SafeKeeping Newsletter, Editor.*** Wrote and edited articles for newsletter aimed at diverse audience (child welfare administrators, staff, clients, researchers, and community members) focusing on community-based approaches to child protective services. Managed production and distribution tasks.
- ***Clearinghouse on Community-Based Approaches to Child Protective Services.*** Developed structure of and collected resources for web-based clearinghouse. Managed dissemination of clearinghouse information to the public.

#### **HONORS**

- Selected Participant, 2000 Summer Research Institute, Cornell University, Sponsored by the National Data Archive on Child Abuse and Neglect.
- Member, Pi Alpha Alpha Honorary Society, 1995.

#### **SERVICE ACTIVITIES**

- Volunteer Ski Coach, New England Disabled Sports, Loon Mountain, Lincoln, NH. 2005-2008.
- Elected Class Representative, Heller School of Social Policy Ph.D. Committee. 2002-2003 and 2003-2004.
- Member, Thirteenth National Conference on Child Abuse and Neglect Advisory Committee, 2000.

#### **COMPUTER SKILLS**

Proficient in MS Word, Excel, PowerPoint, and Project; SPSS; and STATA.

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 Aurora, CO 80045  
 Matthew.nalty@ucdenver.edu  
 303-864-5132

# Matthew J. Nalty

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## Education:

2010 Metropolitan State College of Denver  
 Bachelors of Arts in Psychology

## Professional Experience:

- May 2012 – Present **Kempe Center for the Treatment and Prevention of Abuse and Neglect**  
 Professional Research Assistant – Department of Pediatrics, University of Colorado  
 Supervisors: Katherine Casillas, Ph.D. & John Fluke, Ph.D.  
 Duties:
- Consulting Evaluator for Texas Foster Care Redesign. Advise the Texas Department of Family and Protective Services (TDFPS) on performance measures as the foster care system transfers to private vendors. Utilize Geographic Information Systems to analyze bed availability by level of care within a specified region and distance traveled when a child is removed from home and placed in state paid foster care. Mapping products and reports including statistical analysis are created to inform TDFPS on baselines, prospective targets, and actuals as provided by the regional vendor.
  - Evaluator for Family Connections Grant: No Place Like Home. Survey construction, data collection, and outcome analysis. This study is focused on Family Group Decision Making (FGDM) as it relates to families currently receiving in-home services. Datasets are constructed from caregiver, facilitator, and meeting fidelity surveys then merged with administrative data extracted from State SCAWISs. This data informs semi-annual and annual reports to the Federal Project Officer as well as presentations at the National Conference on Child Abuse and Neglect on the successes and challenges of implementing FGDM as a best practice.
  - Technical Specialist for Colorado Department of Human Services Training Academy. Provide technical support for all aspects of the Academy as an employee of the CMO. Setup and maintain Regional Training Centers in Garfield, Fremont, and Larimer counties.
  - Provide analytic support to a variety of projects throughout the Kempe Center. All evaluation and analytic duties require an advanced level of experience with Microsoft products (e.g., Word, Excel, and SharePoint) and SPSS.
- June 2010 – May 2012 **American Humane Association**  
 Research Assistant & IRB Administrator – Children's Innovation Institute  
 Supervisors: Katherine Casillas, Ph.D. & John Fluke, Ph.D.  
 Duties:
- Provide technical and analytic support to programs across all programmatic areas; data collection, preparation, construction, and interpretation; prepare and disseminate research reports and information to internal staff, external clients and the

general public in mediums that are easily understood by both expert and layperson. Use statistical and database software (e.g., SPSS, Access) to enter, process, and analyze datasets; project management; technical assistance and support related to Humane Research; and some qualitative research, evaluation and analysis, including interviews and focus groups.

- Serve as an IRB Administrator; main point of contact for principal investigators, review incoming applications, facilitate full review board meetings, create and modify application and approval/rejection forms.
- Manage Geographic Information Systems (GIS) with primary responsibility for designing, developing, implementing, and managing computer based GIS databases and cartographic information. Worked with the state of Texas to evaluate out of home placement capacity and distance of placement from a child's home county. Using data from the National Child Abuse and Neglect Data System evaluated frequency of reports and substantiated reports at local state and national levels. Created numerous map products that display programmatic impact used in response to RFPs/RFIs and other funding streams.
- Manage Microsoft SharePoint System for all departments. This includes site construction, user management, document sharing management, training on SharePoint navigation for internal staff and external partners with an emphasis on building team sites, managing permissions and licenses for site collections, design changes, and enhancing user experience.

### Selected Publications & Presentations:

**Nalty, M. J., & Fluke, J.** (2013, June). *Children in out-of-home placement: How far have they moved?* Oral paper presentation at ESRI International User Conference, San Diego, CA.

Tull, T., & **Nalty, M. J.** (2011). Women's bean project: From a hill of beans to a productive life [Monograph]. *Council for Standards in Human Services Education*, Monograph Series, 160-189. [http://www.cshse.org/pdfs/Hagen\\_8-4-2011.pdf](http://www.cshse.org/pdfs/Hagen_8-4-2011.pdf)

Andresen, D. R., & **Nalty, M. J.** (2010, May). *Rotation of currently-viewed objects updates representations of previously-viewed objects*. Poster session presented at Association for Psychological Science, Boston, MA.

**Nalty, M. J., & Andresen, D. R.** (2010, April). *Dynamic versus static rotation cues for updating visual object representations*. Oral presentation at Rocky Mountain Psychology Association, Denver, CO

Hatch, J., King, S., **Nalty, M.J.**, Ung, N., Valdez, G. (2010, April). *Does anonymity affect extroversion?* Poster presentation at Rocky Mountain Psychology Association, Denver, CO

**Nalty, M. J., & Andresen, D. R.** (2009, April). *Object recognition from different viewpoints*. Oral presentation at Rocky Mountain Psychology Association, Albuquerque, NM.

Abeyta, L., Brown, A., King, S., **Nalty, M. J.**, Reily, B., & Valdez, G., et al. (2009, April). *The effects of aggression on conformity*. Poster presented at Rocky Mountain Psychology Association, Albuquerque, NM.

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## BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors.  
Follow this format for each person. **DO NOT EXCEED FOUR PAGES.**

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NAME	POSITION TITLE		
Fred H. Wulczyn	Senior Research Fellow		
eRA COMMONS USER NAME (credential, e.g., agency login)			
EDUCATION/TRAINING <i>(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable.)</i>			
INSTITUTION AND LOCATION	DEGREE <i>(if applicable)</i>	MM/YY	FIELD OF STUDY
Juniata College	BS	June, 1975	Psychology/Sociology
Marywood University	MSW	May, 1979	Social Work
University of Chicago	Ph.D.	Dec., 1986	Social Policy

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### A. Personal Statement

Throughout my career, I have been interested in bridging that gap between research, policy, and practice. To that end, I have dedicated significant time to the design of sophisticated longitudinal data based from the electronic records collected by public agencies. This work led to the development of the Multistate Foster Care Data Archive. With the records of more than 3 million covering in some cases 25 years, the Archive is the largest and oldest repository of longitudinal placement data available anywhere in the world. Among other research projects carried out with that data, we have developed a sophisticated simulation laboratory for studying the likely impact of policy and program on the well-being of children touched by the child welfare system.

### B. Positions

#### Positions and Employment

1979-1982	<b>Research Assistant</b> , Children's Policy Research Project, School of Social Service Administration, University of Chicago
1982-1985	<b>Research Associate</b> , NORC, and School of Social Service Administration, University of Chicago
1983-1984	<b>Project Director</b> , Young Parent Program Evaluation, Social Policy Research Center, NORC and the University of Chicago
1985-1986	<b>Director</b> , Information Resources, Chapin Hall Center for Children at the University of Chicago
1986-1996	<b>Senior Policy Analyst</b> , New York Department of Social Services
1989-1990	<b>Visiting Research Professor</b> , State University of New York at Albany
1992-1997	<b>Assistant Professor</b> , Columbia University School of Social Work
1994-1996	<b>Director</b> , Child Welfare Managed Care Initiative, NY Department of Social Services
1996-2002	<b>Research Associate (Assistant Professor)</b> , University of Chicago
1996-2010	<b>Research Fellow</b> , Chapin Hall Center for Children at the University of Chicago
2002-2006	<b>Research Associate (Associate Professor)</b> , University of Chicago
2004-Present	<b>Director</b> , Center for State Foster Care and Adoption Data, Chapin Hall Center for Children at the University of Chicago



2006-Present	<b>Research Associate (Professor)</b> , University of Chicago
2010-Present	<b>Special Advisor</b> , Commissioner Bryan Samuels, Administration for Children, Youth and Families, US Department of Health and Human Services (as an IPA)
2011-Present	<b>Senior Research Fellow</b> , Chapin Hall at the University of Chicago

### **Honors**

2004	Distinguished Alumni Award – Marywood University
2005	Distinguished Alumni Achievement Award – Juniata College
2006	Peter A. Forsythe Award for Leadership in Child Welfare – National Association of Public Child Welfare Administrators
2011	James E. Flynn Prize for Research - University of Southern California School of Social Work
2012	Doctor of Humane Letters, <i>honoris causa</i> , Marywood University

### **C. Selected Peer-reviewed Publications**

Wulczyn, Fred and Britany Orlebeke, *Fiscal Reform and Managed Care in Child Welfare: Four Case Studies*, **Policy and Practice**, (2000).

Wulczyn, Fred, Joseph Kogan, and John Dilts, *The Effects of Population Dynamics on Performance Measurement*, **Social Service Review**, (2001).

Wulczyn, Fred, Kristen Brunner, and Brenda Jones Harden, *Infant Placements in Foster Care*, **Infant Mental Health Journal**, (2002).

Baker, Amy, Fred Wulczyn, and Nan Dale. *Covariates of Length of Stay in Residential Treatment*. **Child Welfare**. (2003).

Wulczyn, Fred. *Closing the Gap: Are Changing Exit Patterns Affecting the Time African American Children Spend in Foster Care Relative to Caucasian Children*. **Children and Youth Services Review**, (2003).

Wulczyn, F., Joseph Kogan, and Brenda Jones Harden. (2002). *Placement Stability and Movement Trajectories*. **Social Service Review**, (2003).

Wulczyn, Fred. *Reunification from Foster Care*. **The Future of Children**, The David and Lucille Packard Foundation: (2004).

Courtney, Mark, Barbara Needell, and Fred Wulczyn. *Unintended Consequences of the Push for Accountability: The Case Of National Child Welfare Performance Standards*. **Children and Youth Services Review**. 2004.

Barth, Richard, Fred Wulczyn, and Tom Crea. *From Anticipation to Evidence: Research on the Adoption and Safe Families Act*. **Virginia Journal of Social Policy and the Law**. (2004/2005).

Wulczyn, Fred and Emily Zimmerman. *Siblings in Foster Care: A Longitudinal Perspective*. **Children and Youth Services Review**. 2005.

Wulczyn, Fred and Lijun Chen. *Adoption Dynamics: Impact of the Adoption and Safe Families Act*. **Social Service Review**. (2006).

Wulczyn, Fred, Lijun Chen, and Britany Orlebeke. *Evaluating Contract Agency Performance*. **Children and Youth Services Review**. (2009).

Wulczyn, Fred. *Epidemiological Perspectives on Child Maltreatment*. **The Future of Children**. (2009).

Wulczyn, Fred, Cheryl Smithgall, and Lijun Chen. *Child Well-being: The Intersection of Schools and Child Welfare*. **Review of Research in Education**. (2009).

Wulczyn, Fred, Lijun Chen, and Mark Courtney. *Family Reunification in Social Structural Context*. **Children and Youth Services Review**, 2010.

Wulczyn, Fred, Robert Gibbons, Lonnie Snowden, and Bridgette Lery. Poverty Social Disadvantage, and Black/White Placement Gap. **Children and Youth Services Review**, 2012

## **D. Research Support**

### On-going research support

Principal Investigator. A Longitudinal Study of Children in Out-of-Home Care.

A study of developmental trajectories of children placed in out-of-home care. Includes a significant cohort of Aboriginal children.

Principal Investigator, Evaluation of Tennessee Contract Provider Performance. State of Tennessee.

A study of the performance of individual contract providers with an emphasis on the variability of provider performance and the policy and fiscal implications.

Principal Investigator, The Protect Ohio Title IV-E Project Evaluation, State of Ohio.

An evaluation of how the state of Ohio implemented the IV-E waiver, with particular emphasis on child safety and other outcomes.

Principal Investigator. Simulation Model of Long Run Demand for Residential Care. Center for State Foster Care and Adoption Data (with the Argonne National Laboratory, Center for Advanced Computer Simulation). Project supports the development of agent based simulation and the integration of simulation models into the FCDA OLAP environment.

Principal Investigator, Research Support for NYC: Integrating Research, Policy, and Practice. Administration for Children's Services. A project to evaluate New York City's child welfare reform initiatives.

### Completed research

Principal Investigator. Comparative Analysis of Placement Stability.

Utilizes the Multi-state Foster Care Data Archive to study placement stability in 14 states.

Principal Investigator, Evaluation of the Partnership for Social Change – Highbridge.

A study of foster care placement and maltreatment prevention in a socially disadvantaged neighborhood.

Principal Investigator, (in collaboration with New York City). An Infant System of Care in Bedford-Stuyvesant. U.S. Department of Health and Human Services

An evaluation of a system of care initiative in one neighborhood in New York City.

Principal Investigator, The Evidence Base for Child Welfare Policy, The David and Lucille Packard Foundation, Funds to support the development of a book manuscript with co-authors Barth, Landsverk, Harden and Yuan.

**Robert Gibbons**

Section of Hospital Medicine

Professor of Medicine

Professor of Health Studies and Psychiatry; Director, Center for Health Statistics

**Training**

Degree	Year	Institution	Area
BA	1976	University of Denver	Chemistry & Mathematics
PhD	1981	University of Chicago	Statistics & Psychometrics

**Academic Interests**

Robert Gibbons is a statistician interested in the areas of biostatistics, environmental statistics, and psychometrics. Major themes in his work include development of linear and non-linear mixed effects regression models for analysis of longitudinal data, analysis of environmental monitoring data and inter-laboratory calibration, item response theory and computerized adaptive testing, and the development of new statistical methods in pharmaco-epidemiology and drug safety. Dr. Gibbons is an elected member of the Institute of Medicine of the National Academy of Sciences.

**Representative Publications**

1. Gibbons R.D., & Hedeker D.R. Full-information item bi-factor analysis. *Psychometrika*, 57, 423-436, 1992.
2. Gibbons R.D., Meltzer D., Duan N. Waiting for Organ Transplantation, *Science*, 287, 237-238, 2000.
3. Gibbons R.D. and Bhaumik D. Weighted random-effects regression models with application to inter-laboratory calibration. *Technometrics*, 43, 192-198, 2001.
4. Hedeker D. & Gibbons R.D. *Longitudinal Data Analysis*. New York, John Wiley & Sons, 2006.
5. Gibbons R.D., Segawa E., Karabatsos G., Amatya A.K., Bhaumik D.K., Brown C.H, Kapur K., Marcus S., Hur K., Mann J.J. Random-effect Poisson regression analysis of adverse event reports: The relationship between antidepressants and suicide. *Statistics in Medicine*, 27, 1814-1833, 2008

David R. Schwartz, MSW  
Intelligent Outcome Assessment, LLC



#### Professional Experience:

##### **Chief Executive Officer Intelligent Outcome Assessment, LLC**

**April 2014-Present**

- Responsible for leading and overseeing an organization focused on developing rigorous predictive analytic models and tools for government agencies and corporations. Leads the research, development, strategic partnership, and business development functions.
- Lead predictive analytic model developer for CUNY Hunter College School of Social Work's Medicaid outcome prediction and model development project. Currently managing the analysis and modeling of 40 million Medicaid beneficiary records in partnership with Professor Jonathan Prince at Hunter College School of Social Work. This project was funded by the CUNY Hunter College Research Foundation -- and one of the project's goals is to identify the most salient predictors of inpatient psychiatric hospitalizations for youth and the elderly.
- Responsible for recruiting interdisciplinary research scholars to serve on client model development teams.
- Responsible for cultivating academic research partnerships.

##### **Director of Research and Evaluation William Penn Foundation, Philadelphia, PA**

**June 2013-March 2014**

- Responsible for leading research and evaluation unit at one of the largest foundations in the United States with grant centers focused on the environmental protection, K-12/Pre-K education, arts funding, arts education, and parks/open spaces.
- Leader of the Foundation's grantee performance assessment/management research study to determine the capacity of the Foundation's grantees to assess their performance and leverage data to inform decision-making. The evaluation tool development was informed by a series of interviews with foundation performance assessment/management thought leaders (e.g., Center for Effective Philanthropy, Edna McConnell Clark Foundation, Tauck Foundation, etc.).
- Worked closely with the program teams to develop logic models/theories of change to serve as a framework for reporting, monitoring, evaluation. The logic models are designed to inform the evaluation of individual grants as well as grant portfolios. This requires a collaborative process with grantees of mapping/crosswalking their individual logic model to the Foundation's portfolio logic models.
- Successfully launched the Foundation's first online data visualization technology to inform staff and board decision-making without external consultants. The data visualization technology reads from the Foundation's GIFTS grants management database.
- Leader of the Foundation's innovative utilization of predictive analytic modeling tools to uncover hidden patterns in grantee data. Developed accurate and robust models predicting contributed revenue increases, audience growth, and marketing efficiency increases using the national Cultural Data Project database.
- Responsible for managing internal evaluations (e.g., evaluated the planning phase of a large watershed protection project), and works with the program teams to make course corrections if needed.
- Responsible for managing external evaluations and vetting external evaluators and their proposed methodology.
- Leader of the Foundation's use of extant data sources to evaluate grant portfolios.
- Leader and creator of the Foundation's framework for evidence-informed grantmaking. This requires coaching and building the capacity of program officers to think critically and strategically about the evidence base supporting the interventions prospective grantees propose to the Board of Directors.

- Created new structured reporting and monitoring process to supplant unstructured data collection from grantees. The variables draw on logic models that are being developed across three grant centers.
- Responsible for overseeing the evaluation of the Foundation's integrated data system investment.
- Responsible for presenting on the Foundation's research and evaluation strategy.
- Responsible for developing evidence-based practice toolkit that will be housed on the Foundation's website to help grantees learn about where they can find credible research syntheses and meta-analyses without being overwhelmed. The toolkit will be developed in partnership with research synthesis and translation experts at the Campbell Collaboration.
- Led the launch of the Foundation's new collaboration tool.
- Responsible for supervising and building the research and evaluation capacity of junior-level analysts.
- Responsible for meeting with a diverse group of grantees to discuss their proposed evaluation designs and logic models.

#### **Senior Evaluation Consultant**

**January 2012-June 2013**

#### **TCC Group, Philadelphia, PA, New York, NY, San Francisco, CA**

- Responsible for modeling and evaluating the impact of programs.
- Lead data analytic model developer for nonprofit, foundation, corporate, and government clients at TCC Group.
- Responsible for translating evaluation models for clients, helping them to identify pathways to successful and unsuccessful outcomes in their data for program planning and decision-making.
- Data analytics lead for the Gap Foundation's Plan Ahead education project for high school students.
- Arts and Classroom Resources team lead for Target Corporation's Community Relations' evaluation and research projects. Developed web-based data collection system that auto-populates into Excel-based dashboards/scorecards to help the Target Arts team with ongoing assessment, planning, and capacity building. Currently conducting research on the impact of classroom resources on student outcomes to guide Target's classroom resources grant making.
- Data analytics lead for Tufts Health Plan Foundation evaluation project. Developed logic model with several grantees and foundation staff to set the stage for data collection. Developed universal data collection instrument to evaluate three different program areas for the foundation. This project blends quantitative and qualitative research methods.
- Predictive analytic modeling lead for the State of Florida Department of Children and Family Services' Statewide Automated Child Welfare Information System redesign project in partnership with IBM.
- Conducted qualitative research study on nonprofit growth and scaling for Grantmakers for Effective Organizations (GEO). This research was recently published by GEO (Pathways To Grow Impact: Philanthropy's Role In The Journey).
- Pioneering the use of data analytics in TCC Group's evaluation and research division.
- Started up TCC Group's new Data Mining division (\$1.2 million in revenue, and the division was developed 10 months ago) with Peter York.
- Experience using data analytics/machine learning to help with survey item reduction.
- Co-lead on a data analytics project focused on volunteering outcomes for Girl Scouts of Northern California.
- Lead technology and model developer, and project manager, for a national Feeding America project. The goal is to develop a dynamic sustainability assessment tool for the Feeding America Backpack program. This project blends cutting edge quantitative data mining/predictive analytics with qualitative interviews.
- Developing data analytic models for senior centers across the country, helping center administrators and staff to predict negative outcomes as early as possible.
- Hired by the New Zealand Ministry of Social Development to review their predictive analytic modeling work that was based on previous child welfare predictive modeling work (Schwartz, Kaufman, Schwartz, 2004).
- Project manager for the evaluation of Family Reading Partnership's services to the community. The first phase of the project is a baseline survey of young parents in the Ithaca area.

#### **President and CEO**

**2001-2012**

#### **Q-linx, Inc., Government Data Analytics, Philadelphia, PA**

- Responsible for managing and collaborating with interdisciplinary teams of social science researchers, engineers, and programmers working on multiple data analysis and analytics projects in Philadelphia, the United States, and internationally.
- Provided evaluation, data analytics, and recruitment consulting services for two U.S. Department of Education Transition to Teaching grants.
- Worked on a large multi-phase data analytics research project for the New York State Office of Children and Family Services (OCFS). Q-linx and IBM were partners on the project.
- Developed eight predictive models for OCFS based on their CFSR Program Improvement Plan outcome, reentry into the child welfare system. The final models were able to predict substantiated investigations (and reentry for children with prior investigations) with 91 percent accuracy, and unsubstantiated investigations with 90 percent accuracy.
- Responsible for analyzing OCFS's database and assessment protocols.
- Presented analytics results to OCFS's Chief Information Officer and other deputy commissioners and agency administrators.
- Helped to prepare OCFS deputy commissioners for their data analytics research presentation at the Yale University Stewards of Change Conference, "From Field to Fed II: Linking Systems to Sustain Interoperability in Challenging Times" (3/11), and the New York Public Welfare Association's (NYPWA) conference (7/11).
- Provided expert SACWIS and AFCARS reporting system consulting for Children's Right's D.G. v. Henry class action lawsuit filed on behalf of 10,000 children living in Oklahoma's child welfare system. Analyzed database change management processes, database testing/quality assurance, and reports (federal and state) generated from the database.
- Conducted research with Temple University faculty and students from Computer and Information Sciences and Criminal Justice departments to develop machine learning-based juvenile delinquency risk assessment models utilizing data from the Philadelphia Department of Human Services. The models reached 90 percent accuracy. The project used integrated data from the School District of Philadelphia, the Philadelphia Department of Human Services, and Family Court.
- Working with Temple University computer science professor and Q-linx consultant Dr. Zoran Obradovic to develop individual, corporate, and foundation data analytics algorithms to assist nonprofits and universities with targeted fundraising efforts.
- Developing a multidisciplinary, multi-agency operational information exchange and data analytics project with Dr. Susan Kinnevy, Deputy Commissioner for the Philadelphia Department of Human Services, Dr. Don Schwarz, Deputy Mayor for Health and Opportunity for the City of Philadelphia, Dr. Dennis Culhane, Professor, University of Pennsylvania School of Social Policy and Practice, Dr. Richard Gelles, Dean, University of Pennsylvania School of Social Policy and Practice, Dr. Peter Jones, Professor and Senior Vice Provost, Temple University Department of Criminal Justice, and Dr. Zoran Obradovic, Professor, Computer and Information Sciences Department at Temple University, and Director of the Center for Data Analytics and Bioinformatics.

**Founder and Vice President for Research and Development  
Q-linx, Inc., Government Data Analytics, Philadelphia, PA**

**1998-2001**

- Led and interdisciplinary research project at the University of Pennsylvania exploring the novel application of predictive analytic modeling/machine learning techniques to support decision-making in human services. Collaborated with a team of professors and students from the University of Pennsylvania School of Engineering and Applied Sciences, the Wharton School of Business, and the School of Social Policy and Practice. The neural network machine learning technology models learned to predict severe child maltreatment with 90 percent accuracy utilizing a nationally representative dataset, significantly outperforming existing tools used in the field.
- Initiated longstanding research, development, and sales partnership between IBM and Q-linx (2000-2012) to apply data analytics and machine learning technologies to the prediction and prevention of child maltreatment.

- Responsible for developing a Wharton Journal award winning business plan for Q-linx, and supervising a multi-disciplinary team of students for research assistance.
- Developed Q-linx risk assessment and online case management prototype.
- Pilot tested online case management prototype at Volunteers of America Delaware Valley.
- Conducted research for IBM using the Third National Incidence Study of Child Abuse and Neglect, using IBM data analytics technology.

**Director of Development  
Child, Inc., Wilmington, DE**

**1997-1998**

- Responsible for developing fundraising proposals and evaluation designs for one of Delaware's largest nonprofit organizations, serving roughly 20,000 clients per year.
- Generated over \$1 million for a new shelter and support services for victims of domestic violence and their children.
- Conducted research to support funding proposals and agency reports.
- Provided strategic planning, needs assessment, and program/outcome evaluation services.
- Developed several successful proposals and presentations to foundations and government agencies.

**Social Work Intern  
Cooper Family Medicine, Camden NJ**

**1996-1997**

- Helped administrators with the development of an outcome measurement system.
- Provided case management data analysis services (e.g., analyzing patient visits by disease).
- Assisted with the selection and development of a management information system.

**Social Work Intern  
Children's Hospital of Philadelphia**

**1995-1996**

- Case manager in CHOP's school-based health clinic at University City High School.
- Provided health prevention and other case management/social work services in the multi-disciplinary health clinic.
- Part of a team that ultimately helped University City High School to significantly reduce teen pregnancies.

**Case Manager**

**The Choice Program, Prince George's County, MD**

**1994-1995**

- Worked with juvenile delinquents to help them transition into the community.
- Interfaced with health, probation/parole, school, and child welfare systems.
- Provided direct services to youth in their home and schools.
- Worked with at-risk youth in school-based prevention program, Choice Middle Schools.

**Education:**

**University of Pennsylvania  
School of Social Policy and Practice  
MSW, Macro Practice Concentration, 1997**

**University of Michigan, Ann Arbor  
BA, 1994**

**Awards:**

- **Wharton Business School Journal, Most Socially Responsible Business Plan Award, Q-linx.com (2000).**
- **Emerging Practice Research Scholar Award, Third International Conference on Practice Research (June, 2014).**

## Research Publications

- Schwartz, D. R., Kaufman, A. B., & Schwartz, I. M. (2004). Computational intelligence techniques for risk assessment and decision support. *Children and Youth Services Review*, 26, 1081-1095.
- Jones, P. R., Schwartz, D. R., Schwartz, I. M., Obradovic, Z., & Jupin, J. (2006). Risk classification and juvenile dispositions: What is the state of the art? *Temple Law Review*, 79, 2, 461-498.
- Schwartz, I. M., Jones, P. R., Schwartz, D. R., & Obradovic, Z. Improving Social Work Through the Use of Technology and Research, *Child Welfare Research*, edited by Duncan Lindsey and Aron Shlonsky. (2008). Oxford University Press: New York.
- Schwartz, I. M., Jones, P. R., & Schwartz, D. R. (2010). Juvenile probation and youth corrections trends in the United States and the implications for social work. *Korean Journal of Correctional Social Welfare*, 1, 151-169.

## Other Publications

- Chen, P., Murphy, S., Schwartz, D. R., & Vilhauer, H. (2013). Unlocking the mystery of volunteer retention: How girl scouts of Northern California is using advanced predictive analytics to inform its volunteer management practices. *Stanford Social Innovation Review Blog*.

## Selected Presentations

Numerous presentations and papers on augmenting training, risk assessment, and decision-making with technology have been delivered:

- Using Prediction and Data Mining to Match Clients to Services and Evaluate Programs, Advancing the Science of Children's Services through Large Data, First 5 LA/USC/ University of California Berkeley Children's Data Network convening. (2014).
- Blending Quantitative and Qualitative Methods to Predict Volunteer Retention, American Evaluation Association. (2013).
- Uncovering Pathways to Success for Senior Center Participants with Predictive Analytic Modeling, American Society on Aging National Conference (with Peter York and Robin Burstein). (2013)
- Risk Assessment Models and Empirical Validity: Making Life and Death Decisions, Panel Discussion, Conference Faculty/Panel Presenter. One Child Many Hands Conference, a Multi-Disciplinary Conference on Child Welfare, University of Pennsylvania. (2009).
- Risk Classification in Juvenile Justice and Child Welfare: The Dangers of Overconfidence. Paper presented at the annual meeting of the American Society of Criminology (with Peter R. Jones and Ira M. Schwartz). (2008).
- The International Society for the Prevention of Child Abuse and Neglect, as accepted presenter and invited session chair (Berlin, Germany, Warsaw, Poland, and Lisbon, Portugal).
- Temple University Medical School, Grand Rounds (2008).
- National Symposium on Child Sexual Abuse, Chair and Presenter (2008).



- Facilitated IBM master class presentations, IBM sales team briefings/training, and invited presentations at several APHSA Conferences.
- US Department of Education National Transition to Teaching Conference (2008).

**Competencies:**

IBM SPSS Statistics 19, IBM SPSS Modeler, multi-disciplinary research, CHAID, neural networks, classification and regression trees, C5.1, support vector machines, factor analysis/principal components analysis, feature selection, predictive analytics, foundation data mining and analytics, evaluation project management, nonprofit management, nonprofit fundraising, data analytics and evaluation consulting, child welfare and juvenile justice research, advanced data mining, program evaluation, blending quantitative and qualitative research, risk assessment, data mapping, supervising programmers and researchers, social welfare policy, market research/analysis, delivering research presentations, data analytics/machine learning research design, fundraising/development data mining, philanthropic social networking technology, proposal development/grant writing, strategic planning, business planning, social entrepreneurship, C-level meeting facilitation, sales presentations, client relations, IT project management, research and development, Microsoft Office, MIS/management information systems, Matlab, MS Project, Salesforce 11, Raiser's Edge, SACWIS systems, case management software/systems, case management, electronic discovery systems, child protective services (CPS), government consulting, business intelligence reporting, Adapa Cloud-based Model Server Engine, Qualtrics, Survey Monkey.

Silberman School of Social  
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2180 3<sup>rd</sup> Avenue  
New York, NY 10035

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E-mail: jprin@hunter.cuny.edu

# Jonathan D. Prince

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## Education

### **Ph.D. in Social Welfare**

1998 - 2002                      The University of California, Berkeley

- Specialized in mental health services research

### **Master's in Social Welfare (M.S.W.)**

1997-1999                      The University of California, Berkeley

- Management and planning track

### **Master's in Clinical and Community Psychology (M.A.)**

1988 -1991                      The University of Illinois, Urbana-Champaign

- Specialized in psychopathology research

### **B.A. in Psychology (honors program)**

1983 -1987                      New York University, New York, N.Y.

- Minor in computer science and mathematics
- Graduated Phi Beta Kappa and Magna Cum Laude

## Professional experience

### **Assistant Professor of Social Work**

Sept., 2009 – Present      Hunter College, City University of New York  
School of Social Work

- Researching services for people with mental health, health, or substance abuse problems, risk factors for those problems, and interventions that prevent adverse consequences such as hospitalization or incarceration
- Examining HIV/AIDS, sexually transmitted disease, and substance abuse in persons with serious mental illness
- Researching polysubstance abuse and outcomes among youth (depression, delinquency, health disturbance) and adults (suicide attempt, hospitalization, physical illness)
- Analyzing 14-state Medicaid data in order to explore the aforementioned topics, and in order to explore onset of mental illness, physical illness, or substance abuse in youth and adults (Principal Investigator: in partnership with Mary McKay at New York University)

- Evaluating hospitalization and readmission in 10 New York City Psychiatric Hospitals (Principal Investigator: in partnership with the NYC Department of Health and Mental Hygiene)
- Evaluating the post-earthquake mental health, health, and substance abuse needs of Haitian residents of New York City (Principal Investigator: in partnership with Martha Bragin and the NYC Department of Health and Mental Hygiene)
- Evaluating two community reentry programs for formerly incarcerated adults in New York City (Principal Investigator for one program and Co-PI for the other)
- Teaching *Human Behavior and the Social Environment I and II*, *Research in Social Work I and II*, and a self-developed elective entitled *Community Mental Healthcare*
- Chair of the research curriculum in the MSW program

### **Assistant Professor of Social Work**

Jan., 2003 – June, 2009 Rutgers: The State University of New Jersey  
School of Social Work

- Completed and published 16 studies in peer-reviewed journals (e.g., American Journal of Public Health, American Journal of Orthopsychiatry, Psychiatric Services) that focused on services for people with mood disorder, schizophrenia, or other serious mental illness
- Taught *Human Behavior and the Social Environment*, and *Research Methods in Social Work (I)*
- Developed and taught a course elective entitled *Community Mental Health Care*

### **National Institute of Health Pre-doctoral Fellow**

2001 -2002 Center for Self-Help Research, Berkeley, CA, and  
The University of California, Berkeley

- Investigated recovery from mental illness in long-term users of Northern California self-help agencies

### **Doctoral Research Associate**

1998 - 2001 The Bay Area Social Services Consortium,  
University of California, Berkeley

- Analyzed Northern California human service agency policy

### **Graduate Student Instructor**

1/2001-5/2001 The University of California, Berkeley

- Taught a discussion section of *Introduction to Research*

### **Acting Director**

1995 - 1997                      Conard House, San Francisco, CA

- Provided clinical and administrative supervision to community mental health practitioners in the Director's absence

### **Coordinator of Client Services**

1995 - 1997                      Conard House, San Francisco, CA

- Completed intake interviews and oversaw activities of direct service staff in the delivery of client services

### **Counselor/Senior Counselor**

1992 - 1995                      Conard House, San Francisco, CA

- Provided individual and group counseling to adults with psychopathology

### **Course Instructor**

1990 - 1991                      The University of Illinois, Urbana-Champaign

- Taught *Abnormal Psychology*

## **Publications**

**Journal Articles** –*in press, under review, in process, or published (in reverse chronological order)*

Prince, J.D. (2013). Call for research: detecting early vulnerability for psychiatric hospitalization. *Journal of Behavioral Health Services and Research*, 40, 46-56.

Prince, J.D. (2012). Risk of inpatient stay for mental illness among individuals with substance use disorders. *Psychiatric Services*, 63, 938-941.

Prince, J.D., Akincigil, A., Walkup, J.T., Amin, S., Crystal, S. (2012). Serious mental illness and risk of new HIV/AIDS diagnoses: An analysis of Medicaid beneficiaries in eight states. *Psychiatric Services*, 63, 1032-1039.

Prince, J.D., Akincigil, A., Walkup, J.T., Amin, S., Crystal, S. (in press). Sexually transmitted disease among persons with HIV/AIDS in eight states: Is severe mental illness a risk factor? *Psychiatric Services*

Prince, J.D. (in press). Opioid analgesic use disorders among adolescents in the United States. *Journal of Child and Adolescent Substance Abuse*.

Prince, J.D. & Lalayants, M. (in press). Delinquency, depression, and substance abuse among child welfare-involved adolescent females. *Child Abuse and Neglect*.

Prince, J.D. (under review). Misuse of opioid analgesics versus other drugs in the United States.

Lalayants, M. & Prince, J.D. (under review). Loneliness and depression or depression-related factors among child welfare-involved adolescent females.

Prince, J.D., Akincigil, A., Hoover, D.R., Walkup, J.T., Bilder, S., Crystal, S. (2009). Substance abuse and hospitalization for mood disorder among Medicaid beneficiaries. *American Journal of Public Health*, 99, 160-167.

Prince, J.D., Akincigil, A., Hoover, D.R., Lucas, J., Bowblis, J., Walkup, J.T., Kalay, E., Crystal, S. (2008). Psychiatric re-hospitalization among elderly persons in the United States. *Psychiatric Services*, 59, 1038-1045.

Akincigil, A., Hoover, D.R., Walkup, J.T., Prince, J.D., Kalay, E., Crystal, S. (2008). Hospitalization for psychiatric illness among community dwelling persons in 1992-2002. *Psychiatric Services*, 59, 1046-1048.

Hoover, D.R., Akincigil, A., Prince, J.D., Kalay, E., Lucas, J., Walkup, J.T., Crystal, S. (2008). Medicare inpatient treatment for elderly non-dementia psychiatric illnesses 1992-2002: Length of stay and expenditures by facility type. *Administration and Policy in Mental Health*, 35, 231-240.

Prince, J.D., Akincigil A., Bromet E. (2007). Incarceration rates of persons with first-admission psychosis. *Psychiatric Services*, 58, 1173-1180.

Prince, J.D. (2007). Education, ethnicity, and subjective life quality of recently discharged inpatients with schizophrenia. *Journal of Nervous and Mental Disease*, 195, 560-575.

Prince, J.D. (2007). Therapeutic alliance, illness awareness, and number of hospitalizations for schizophrenia. *Journal of Nervous and Mental Disease*, 195, 170-174.

Prince, J.D. (2007). Promoting consumer empowerment through entrepreneurship: A proposal. *Psychiatric Rehabilitation Journal*, 30, 223-225.

Prince, J.D. (2006). Ethnicity and life quality of recently discharged inpatients with schizophrenia. *American Journal of Orthopsychiatry*, 76, 202-205.

Prince, J.D. (2006). Incarceration and hospital care. *Journal of Nervous and Mental Disease*, 194, 34-39.

Prince, J.D. (2006). Determinants of care satisfaction among inpatients with schizophrenia. *Community Mental Health Journal*, 42, 189-196.

Prince, J.D. (2006). Practices preventing re-hospitalization of individuals with schizophrenia. *Journal of Nervous and Mental Disease*, 194, 397-404.

Prince, J.D. (2005). Predicting outpatient mental health program withdrawal among recently discharged inpatients with schizophrenia. *Psychological Services*, 2, 142-150.

Prince, J.D. (2005). Life contentment and mental health care satisfaction. *Research on Social Work Practice*, 15, 564-567.

Prince, J.D. (2005). Family involvement and satisfaction with community mental health care of individuals with schizophrenia. *Community Mental Health Journal*, 41, 419-430.

Prince, J.D. & Austin, M.J. (2005). Inter-agency collaboration in child welfare and child mental health systems. *Social Work in Mental Health*, 4, 1-19.

Baer, J., Prince, J.D. & Valez, J. (2004). Fusion or familialism: A construct problem in studies of Mexican-American adolescents. *Hispanic Journal of Behavior Sciences*, 26, 263-273.

Austin, M.J. & Prince, J.D. (2003). The implications of managed care and welfare reform for the integration of health and welfare services. *Journal of Health and Social Policy*, 18, 1-19.

Prince, J.D. & Austin, M.J. (2001). Innovative programs and practices emerging from the implementation of welfare reform: A cross-case analysis. *Journal of Community Practice*, 9, 1-14.

### **Brief Commentary**

Prince, J.D. (2013). Critical time intervention reduces psychiatric re-hospitalization among formerly homeless individuals with psychotic diagnoses (commentary). *Evidence-Based Mental Health*, 16, 38.

Prince, J.D. (2012). HIV/AIDS and serious mental illness: A risky conclusion: In reply (letter). *Psychiatric Services*, 63, 1261.

Prince, J.D. (2006). Policy challenges in modern health care (book review). *Journal of Nervous and Mental Disease*, 194, 721-722.

Prince, J.D. (2005). Efforts to encourage entrepreneurship among persons with mental illness. *Psychiatric Services*, 56, 359-360.

Prince, J.D. & Segal, S.P. (2005). An empowering medical model of mental health care. *Psychiatric Services*, 58, 901.

### **Book Chapters**

Prince, J.D. & Austin, M.J. (2004). Overview of innovative programs and practices. In M.J. Austin, ed. *Changing Welfare Services: Case Studies of Local Welfare Reform Programs*. New York: The Haworth Press, Chapter 2.

Prince, J.D. & Austin, M.J. (2004). Training exempt providers to deliver high-quality child care programs. In M.J. Austin, ed. *Changing Welfare Services: Case Studies of Local Welfare Reform Programs*. New York: The Haworth Press, Chapter 5.

Prince, J.D. & Austin, M.J. (2004). Combining business with rehabilitation in a public work center for disabled and low-income participants. In M.J. Austin, ed. *Changing Welfare Services: Case Studies of Local Welfare Reform Programs*. New York: The Haworth Press, Chapter 7.

Prince, J.D. & Austin, M.J. (2004). Merging a workforce investment board and a department of social services into a county department of employment and human services. In M.J. Austin, ed. *Changing Welfare Services: Case Studies of Local Welfare Reform Programs*. New York: The Haworth Press, Chapter 21.

Prince, J.D. & Austin, M.J. (2004). Crossover services between child welfare and welfare-to-work programs. In M.J. Austin, ed. *Changing Welfare Services: Case Studies of Local Welfare Reform Programs*. New York: The Haworth Press, Chapter 23.

## **Grants**

2011-Present: Principal Investigator (with two Co-PIs from the New York City Department of Health and Mental Hygiene) on a grant evaluating the effectiveness of New York City psychiatric hospitals (\$545,000)

2011-2012: Principal Investigator (with Martha Bragin, Ph.D.) on a federal Emergency Response Grant from the Substance Abuse and Mental Health Services Administration (in partnership with the New York City Department of Health and Mental Hygiene) evaluating outreach and referral services for Haitian immigrants living in New York City with mental health or substance abuse problems relating to the Haitian earthquake (\$318,000)

2011-Present: Principal investigator for research assessing psychiatric service use and outcomes among Medicaid beneficiaries in 14 American states (with Mary McKay, Ph.D. at New York University (\$32,000)

2013-Present: Principal Investigator – Presidential Fund for Faculty Development Award at the City University of New York: Researching questionable prescription practices among Medicaid beneficiaries in 14 American States (\$3000)

2011-Present: Principal Investigator on an evaluation of a prisoner reentry program in New York City (Greenhope Services for Women) (\$25,000 per year)

2011-Present: Co-investigator (with Anthony Dejesus, Ph.D. and George Patterson, Ph.D.) on an evaluation of SAMHSHA services for addressing chronic homelessness and HIV among formerly incarcerated women in the Greenhope Housing Development Association (\$50,000 per year)

2010-2011: Principal Investigator on a grant from the Professional Staff Congress-City University of New York Research Award Program to study psychotherapy use and the prevention of psychiatric hospitalization (\$6000)

2009-2010: Principal Investigator on a grant from the Professional Staff Congress-City University of New York Research Award Program to study substance abuse and psychiatric hospitalization (\$4000)

2003-2010: Received a two-year grant, and two two-year renewals (totaling about \$90,000), from the National Institute of Health's Loan Repayment Program (LRP)

### **Conference Presentations**

Prince, J.D., & Lalayants, M. Delinquency, Depression, and Substance Use Disorder among Child Welfare-Involved Adolescent Females. Council on Social Work Education, Dallas, Texas, 10/31-11/3.

Lalayants, M. & Prince, J.D. Loneliness and Depression or Depression-Related Factors among Child Welfare-Involved Adolescent Females. Council on Social Work Education, Dallas, Texas, 10/31-11/3.

Patterson, G., Dejesus, A. & Prince, J.D. Use of the Level of Service Inventory-Revised (LSI-R) among Female Offenders. Council on Social Work Education, Dallas, Texas, 10/31-11/3.

Prince, J.D., Walkup, J.T., Amin, S., Elkowitz, J., Crystal, S. (2009). Risk for HIV infection among Medicaid Beneficiaries with Serious Mental Illness. Society for Social Work Research, Washington, D.C., 1/11/12-1/15/12.

Prince, J.D., Walkup, J.T., Amin, S., Elkowitz, J., Crystal, S. (2009). Predicting HIV/AIDS: Is Serious Mental Illness a Risk Factor in Medicaid Beneficiaries? American Public Health Association Annual Conference, Boston, MA., 11/4/09-11/8/09

Prince, J.D. (2007). Incarceration of persons with first admission psychosis. The Eighth Workshop on Costs and Assessments in Psychiatry: Investing in Mental Health Policy and Economics Research, Venice, Italy, 3/09/07-3/11/07

Prince, J.D. (2006). Predicting outpatient program withdrawal among recently discharged individuals with schizophrenia. American Public Health Association Annual Conference, Boston, MA, 11/4/06-11/8/06

Prince, J.D. (2006). Predicting outpatient program withdrawal among recently discharged individuals with schizophrenia. Society for Social Work Research, San Antonio, Texas, 1/12/06 – 1/15/06

Prince, J.D. (2006). Ethnicity and life quality among recently discharged inpatients with Schizophrenia. Annual Program Meeting of the Council on Social Work Education, Chicago, Illinois, 2/16/06 – 2/19/06

Prince, J.D. (2002). Innovations in welfare reform implementation: A cross-case analysis. Annual Program Meeting of the Council on Social Work Education, Nashville, Tennessee, 2/24/02 – 2/27/02



**Peer-Reviewer for Manuscripts Submitted to Journals**

American Journal of Public Health  
Journal of Public Health  
Bulletin of the World Health Services Organization  
Archives of General Psychiatry  
The American Journal of Orthopsychiatry  
Psychiatric Services  
Drug and Alcohol Dependence  
BMC Psychiatry  
The Psychiatric Rehabilitation Journal  
Psychological Services  
The Journal of Nervous and Mental Disease  
The Community Mental Health Journal  
Research on Social Work Practice  
Journal of Behavioral Health Services and Research  
Evidence-Based Mental Health  
Journal of Teaching in Social Work

***Tool Descriptions***

Overview of Computerized Adaptive Mental Health Testing

IOMA - Intelligent Outcome Management and Assessment

IBM SPSS Modeler Professional

IBM SPSS Modeler Server performance and optimization

Agent-Based Social Simulation in the Service of Child Welfare Issues: Defining the Demand for Group and Residential Care

## Overview of Computerized Adaptive Mental Health Testing

The Computerized Adaptive Test-Mental Health or CAT-MH, is currently a collection of three adaptive tests for depression, anxiety, and mania, and a diagnostic screening test for major depressive disorder (CAD-MDD) developed as part of a 5-year grant from the National Institute of Mental Health. The CAD-MDD produces a screening diagnosis of depression and a corresponding confidence level associated with that diagnosis. By contrast, the three computerized adaptive tests (CAT), the CAT-Depression Inventory or CAT-DI, the CAT-Anxiety or CAT-ANX and the CAT-bipolar disorder or CAT-BP, are dimensional measures that produce continuous severity scores based on symptomatology experienced in the past two weeks. The paradigm shift between traditional screening and assessment tools and those associated with these tests is that they begin with a large “bank” of items (1008 psychiatric symptom items) and adaptively administer a small and statistically optimal subset of the items (on average 12 items for each of the three CATs and 4 items for the CAD-MDD). Nevertheless, each of the CATs maintains a correlation of close to  $r=0.95$  with the entire bank of items for each test (389 depression items, 431 anxiety items, 88 bipolar items). As such, with only 12 items in 2 minutes over the internet, we can extract the information contained in hundreds of items in the item bank. Results for the CAT-DI (depression test) have recently been published in *JAMA Psychiatry*, the CAT-ANX in the *American Journal of Psychiatry*, and the CAD-MDD in the *Journal of Clinical Psychiatry*. In terms of our ability to screen for depression, the CAD-MDD has remarkably high sensitivity of 0.95 and specificity of 0.87 with an average of only 4 items (max=6 items). As a comparison, the PHQ-9 used in these same subjects had similar specificity, but sensitivity of 0.70 indicating that for every 100 true cases the PHQ-9 would miss 30, whereas the CAD-MDD would only miss 5. This advantage is achieved despite the fact that the CAD-MDD uses less than half the number of items. Patients taking any of these tests are also screened for suicide risk using the Columbia Suicide Severity Rating Scale (C-SSRS) screener.

The ultimate goal of the CAT-MH is to make diagnostic screening of mental disorders such as depression and long term monitoring of the severity of those disorders as seamless as possible, decreasing patient and clinician burden to near zero levels. The CAT-MH will be distributed as a cloud-computing system where a secure and HIPAA compliant internet system is used to assess individuals anytime from anywhere on any internet-capable device. For example, the cloud will permit an individual in urban Chicago, the most remote corner of the Navajo Nation or rural West Virginia to log on 24x7x365 via an internet browser with a mobile computing device, a laptop or a desktop to a secure website with a unique ID and password and take a test. The results of that test and automated suicide warnings can be directly transmitted to any number of reviewers in near real time and can be placed directly into the patient’s electronic medical record (EMR). Weekly monitoring of depressive severity can be performed following a prescription of an antidepressant to insure that the treatment is functioning as intended and this information can be transmitted automatically to the treating physician. It should be obvious that the implementation of the CAT-MH is almost as important as its scientific foundation. A major advantage of CAT in this regard is that repeat testing need not involve the same items, and the starting value for the next session can be informed by the score on the previous session leading to further reduction in patient burden.

1. Gibbons R.D., Weiss D.J., Pilkonis P.A., Frank E., Moore T., Kim J.B., Kupfer D.K. Development of a computerized adaptive test for depression. *JAMA Psychiatry*, 2012;69,1104-1112.
2. Gibbons R.D., Hooker G., Finkelman M.D., Weiss D.J., Pilkonis P.A., Frank E., Moore T., Kupfer .J. The CAD-MDD: A computerized adaptive diagnostic screening tool for depression. *Journal of Clinical Psychiatry*, 74, 669-674, 2013.
3. Gibbons R.D., Weiss D.J., Pilkonis, P.A., Frank E., Moore T., Kim J.B., Kupfer D.J. Development of the CAT-ANX: A computerized adaptive test for anxiety. *American Journal of Psychiatry*, 171, 187-194, 2014.

## Case Study Spectrum

### Education



### Mental Health



### Social Services



### Juvenile Justice



### Adult Justice



Government and Education

Community Care/Program Providers

- Drop-out Prevention
- School Violence Prevention
- School-level Performance Assessment

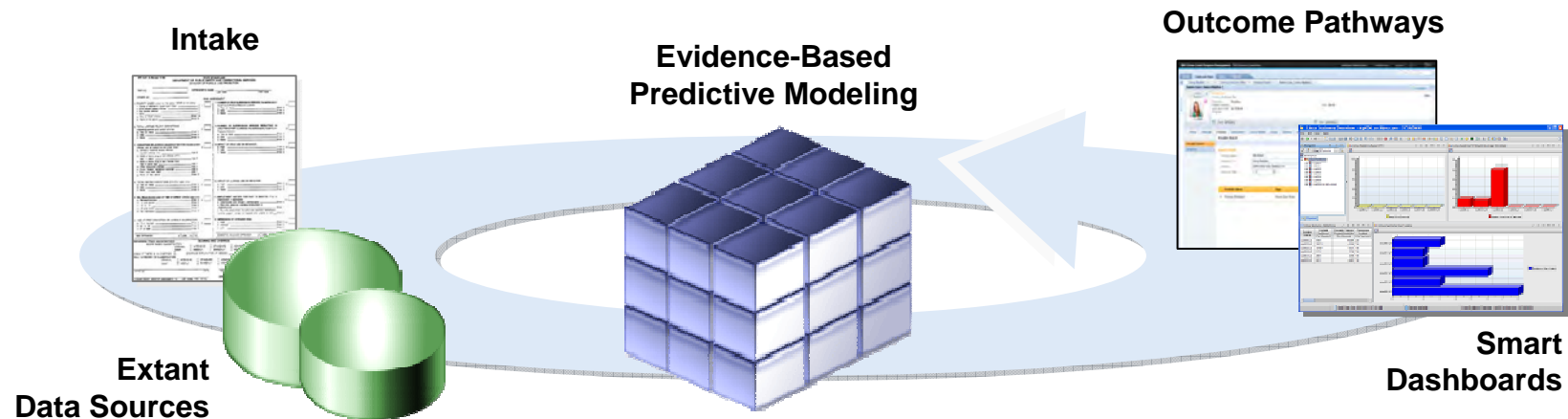
- Hospitalization
- Costly Community-based Placements
- Inappropriate Medication

- Cost-effective Placements
- Child Protective Services
- Cross-over into Justice
- Transitioning Youth

- Detention Alternatives
- Disproportionate Minority Contact
- Juvenile Probation

- Adult Recidivism
- Cost-effective Probation and Parole Placements
- Drug (Courts) Administration
- Gang Identification and Monitoring

## Intelligent Outcome Management and Assessment (IOMA)



### Smart Intervention • Outcome Prediction • Forecasting • Consumer Insights

- Enables outcome determination at point-of-service
- Utilizes smart intake scoring algorithms that learn as intake process unfolds.
- Leverages existing intervention forms or case management systems
- Utilizes native variables and factors; not a one-size-fits-all-jurisdictional model
- Dynamic machine learning system
- Augments existing risk assessment modeling (i.e. SDM)
- Supports program/provider analysis to achieve next-generation risk assessment modeling (combining client risk with dynamic provider performance data)
- Provide frontline practitioner discernible action plan
- Intelligent, customizable dashboard console for operational point-and-click performance monitoring
- Fully integrated with rules-based optimization engines.



---

## Highlights

*Create more effective strategies by evaluating trends and likely outcomes.*

- Easily access, prepare and model structured data with this intuitive, visual data mining workbench.
  - Rapidly build and validate models using the most advanced statistical and machine-learning techniques available.
  - Efficiently deploy insight and predictive models.
  - Seamlessly deploy results directly into IBM® Cognos® Business Intelligence.
  - Present analytic results across regions visually with geographical mapping.
  - Perform in-database analytics with leading databases.
- 

# IBM SPSS Modeler Professional

*Make better decisions through predictive intelligence*

Data mining provides organizations with a clearer view of current conditions and deeper insight into future events by analyzing historical data. IBM SPSS® Modeler Professional is a data mining workbench used to analyze structured data to create predictive intelligence. This intelligence allows business decisions to be made based on the data, rather than “gut feel”.

Businesses of all types have found that they can use the predictive intelligence of IBM SPSS Modeler to attract customers, strengthen their loyalty, reduce customer attrition or “churn” more cost effectively, decrease fraud and minimize risk. Public sector organizations have benefited from using Modeler to predict workforce capacity, proactively respond to public safety issues, manage the student lifecycle, improve classroom performance and address many other operational challenges.

Predictive intelligence enables you to look into the future. Using historical data, SPSS Modeler lets you confidently predict outcomes and gain an understanding about the relationships hidden in your data. This understanding allows you to solve any business problem faster using powerful, proven analytical techniques that deliver deeper insight into your customers, students or constituents.



## Streamline the data mining process

SPSS Modeler Professional is popular with analysts and business users alike. Its automated data preparation and modeling features enable non-analysts to produce accurate models quickly and easily without specialized skills. While professional analysts can take advantage of the software's advanced data preparation and predictive modeling capabilities to create the most sophisticated of streams.

## Organization benefits

Using SPSS Modeler Professional, all types of organizations are performing more in-depth analyses that help them gain insight to achieve greater success.

- Businesses attract customers, strengthen their loyalty, reduce customer attrition more cost effectively, identify and prevent fraud and reduce risk.
- Public sector organizations predict workforce capacity, evaluate program effectiveness and proactively respond to public safety issues.

- Educational institutions manage the student lifecycle, improve classroom performance and address many other student and operational challenges.
- Industrial operations refine maintenance planning to prevent unscheduled downtime.

The intuitive graphical interface of SPSS Modeler makes it easy for users to visualize every step of the data mining process as part of a “stream.” By interacting with these streams, analysts and business users can collaborate—adding business knowledge and domain expertise to the data mining process. It allows them to focus on discovering insights rather than on technical tasks like writing code. They can also pursue “train-of-thought” analysis, explore the data more deeply; uncovering additional relationships that make sense to the organization.



Figure 1: The SPSS Modeler visual interface enables users to build predictive models quickly and intuitively, without the need for programming.

## Easily access and integrate data

From this visual interface, you can easily access and integrate data in virtually any type of database, spreadsheet or flat file, including IBM SPSS Statistics, IBM SPSS Data Collection, Cognos Business Intelligence, SAS and Microsoft Excel files.

When combined with SPSS Modeler Professional Server, there is no need to move data from large databases, since the analytics and mining take place in-database. The result is a significant improvement in analytical performance.

SQL Pushback allows for data transformation and preparation tasks to be performed within the database without the user having to write any SQL or do any programming. Additionally, algorithms from leading databases can be accessed directly with the user-friendly SPSS Modeler interface and built and scored as part of a Modeler stream—supported with IBM InfoSphere®, Microsoft SQL Server, Oracle and IBM Netezza. SPSS Scoring Adapters allow the data to be scored in-database, resulting in quicker decisions and better ROI.

## Integration with IBM Cognos software

Analysts can access data from their Cognos Business Intelligence environment directly within the SPSS Modeler interface. IBM Cognos software organizes and delivers a complete and consistent view of information for enterprise-wide decision making. By adding the analytic capabilities of SPSS Modeler Professional, organizations can quickly and reliably evaluate the likelihood of specific outcomes, using their familiar enterprise-wide data view.

Also, since SPSS Modeler can write results into Cognos Business Intelligence—they can make predictive intelligence available to business users and all information stakeholders who rely on Cognos as their information portal into enterprise analytics.

## Choose from an unparalleled breadth of techniques

SPSS Modeler offers an array of advanced data mining techniques that are designed to meet the needs of every data mining application, including all of the following algorithms.

- **Classification algorithms.** Make predictions or forecasts based on historical data using techniques such as Decision Trees, Neural Networks, Logistic Regression, Support Vector Machines, Cox regression, Generalized Linear Mixed Models (GLMM) and more. Use automatic classification modeling for both binary and numeric outcomes to streamline model creation.
- **Segmentation algorithms.** Group people or detect unusual patterns with automatic clustering, anomaly detection and clustering neural network techniques. Use automatic classification to apply multiple algorithms with a single step and take the guesswork out of selecting the right technique.
- **Association algorithms.** Discover associations, links or sequences using Apriori, CARMA and sequential association.
- **Time series and forecasting.** Generate forecasts for one or more series over time using statistical modeling techniques.

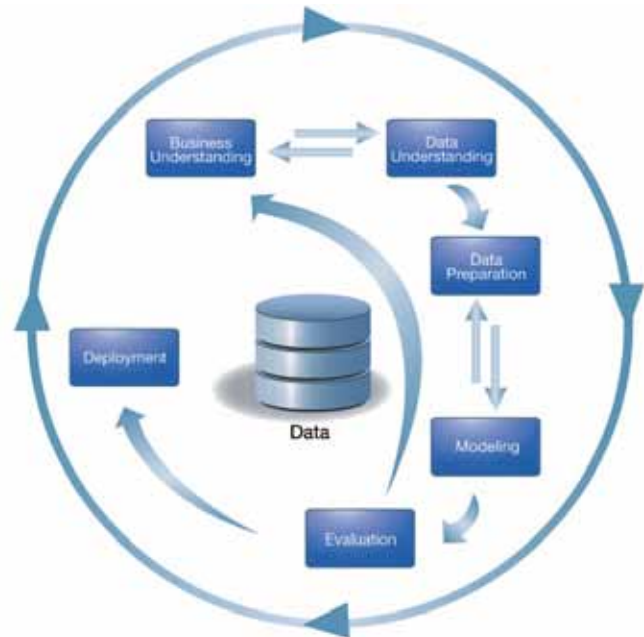


## Optimize your current information technologies

With its open and scalable architecture, SPSS Modeler makes the best use of your existing IT infrastructure. It integrates with your existing systems, both when accessing data and when deploying results, so you don't need to move data into and out of a proprietary format. Additionally, techniques such as in-database mining, SQL pushback, multi-threading, server clustering and in-database scoring help conserve resources, deliver results faster and reduce overall IT costs.

## Follow a proven, repeatable process

During every phase of the data mining process, SPSS Modeler supports the de facto industry standard, the Cross-Industry Standard Process for Data Mining (CRISP-DM). This means users can focus on solving business problems through data mining, rather than on reinventing a new process for every project. Individual Modeler projects can be efficiently organized using the CRISP-DM project manager.



*Figure 2:* The CRISP-DM process, as shown in this diagram, enables data miners to implement efficient data mining projects that yield measurable business results.

## Deploy predictive modeling across the enterprise

SPSS Modeler can efficiently analyze the amounts of data typically generated by small to mid-sized organizations. Organizations with high-volume or complex data mining requirements can take advantage of the additional power of SPSS Modeler Server. Using client/server architecture, SPSS Modeler Server allows many data analysts to work

simultaneously without straining computing resources. You can take advantage of in-database mining and in-database scoring on leading platforms and efficiently process large amounts of data. SPSS Modeler Server also offers additional deployment options to help you extend the benefits of data mining across geographic or functional lines and put results in the hands of decision makers quickly.

IBM SPSS Modeler Professional features	
<b>Data understanding</b>	<ul style="list-style-type: none"> <li>• Create a wide range of interactive graphs with automatic assistance</li> <li>• Use visual link analysis to see associations in your data</li> <li>• Interact with data by selecting regions or items on a graph and viewing the selected information; or select key data for use in analysis</li> <li>• Access SPSS Statistics graphs and reporting tools directly from the SPSS Modeler interface</li> </ul>
<b>Data preparation</b>	<ul style="list-style-type: none"> <li>• Access operational data from Cognos Business Intelligence, IBM DB2®, Oracle, Microsoft SQL Server, IBM Informix®, IBM Netezza, MySQL (Oracle) and Teradata data sources, as well as mainframe data through zDB2 and IBM Classic Federation Server support</li> <li>• Import delimited and fixed-width text files, SPSS Statistics files, SPSS Data Collection data sources, Excel, SAS or XML</li> <li>• Choose from the multiple data-cleaning options available in SPSS Modeler to remove or replace invalid data, automatically impute missing values and mitigate outliers and extremes</li> <li>• Apply automatic data preparation to interrogate and condition data for analysis in a single step</li> <li>• Access data management and transformations performed in SPSS Statistics directly from SPSS Modeler</li> <li>• Use field filtering, naming, derivation, binning, re-categorization, value replacement and field reordering</li> <li>• Apply record selection, sampling (including clustered and stratified sampling), merging (including inner joins, full outer joins, partial outer joins, and anti-joins), sorting, aggregation and balancing</li> <li>• Choose from options for data restructuring, partitioning and transposition</li> <li>• Select from extensive string functions: string creation, substitution, search and matching, whitespace removal and truncation</li> <li>• Apply RFM (Recency, Frequency, and Monetary) scoring: aggregate customer transactions to provide RFM value scores and combine these to produce a complete RFM analysis</li> <li>• Export data to databases, IBM Cognos Business Intelligence packages, SPSS Statistics, SPSS Data Collection, delimited text files, Excel, SAS, or XML</li> </ul>

IBM SPSS Modeler Professional features (continued)	
<b>Modeling algorithms included</b>	<ul style="list-style-type: none"> <li>Anomaly Detection – Detect unusual records through the use of a cluster-based algorithm</li> <li>Apriori – Popular association discovery algorithm with advanced evaluation functions</li> <li>Bayesian Networks – Graphical probabilistic models</li> <li>C&amp;RT, C5.0, CHAID and QUEST – Decision tree algorithms including interactive tree building</li> <li>CARMA – Association algorithm which supports multiple consequents</li> <li>Cox regression – Calculate likely time to an event</li> <li>Decision List – Interactive rule-building algorithm</li> <li>Factor/PCA, Feature Selection – Data reduction algorithms</li> <li>In-database mining algorithms for IBM InfoSphere*: Association, Clustering, Decision Tree, Logistic Regression, Naive Bayes, Regression, Sequence, Time Series</li> <li>In-database mining algorithms for IBM Netezza*: Bayes Net, Decision Trees, Divisive Clustering, Generalized Linear, K-Means, KNN, Linear Regression, Naive Bayes, PCA, Regression Tree, Time Series</li> <li>In-database mining algorithms for Microsoft SQL Server*: Association Rules, Clustering, Decision Tree, Linear Regression, Naive Bayes, Neural Network, Sequence Clustering, Time-Series</li> <li>In-database mining algorithms for Oracle*: Adaptive Bayes, Apriori, Artificial Intelligence (AI), Decision Tree, General Linear Model (GLM), KMeans, Minimum Description Length (MDL), Naive Bayes, Non-Negative Matrix Factorization, O-Cluster (Orthogonal Partitioning Clustering), Support Vector Machine</li> <li>K-Means, Kohonen, Two Step, Discriminant, Support Vector Machine (SVM) – Clustering and segmentation algorithms</li> <li>KNN – Nearest neighbor modeling and scoring algorithm</li> <li>Logistic Regression – For binary outcomes</li> <li>Neural Networks – Multi-layer perceptrons with back-propagation learning, and radial basis function networks</li> <li>Regression, Linear, GenLin (GLM), Generalized Linear Mixed Models (GLMM) – Linear equation modeling</li> <li>Self-learning response model (SLRM) – Bayesian model with incremental learning</li> <li>Sequence – Sequential association algorithm for order-sensitive analyses</li> <li>Support Vector Machine – Advanced algorithm with accurate performance for wide datasets</li> <li>Time-series – Generate and automatically select time-series forecasting models</li> </ul>
<b>Modeling and evaluation</b>	<ul style="list-style-type: none"> <li>Employ a wide range of data mining algorithms with many advanced features to get the best possible results from your data.</li> <li>Use automatic classification (binary and numeric) and clustering in place of selecting individual algorithms</li> <li>Use interactive model and equation browsers and view advanced statistical output</li> <li>Show relative impact of data attributes on predicted outcomes with variable importance graphs</li> <li>Visualize the analytic results on geographic maps</li> <li>Combine multiple models (ensemble modeling) or use one model to analyze a second model</li> <li>Use the SPSS Modeler Component-Level Extension Framework (CLEF) to integrate custom algorithms</li> <li>Use the R statistical programming language to extend analysis options, through the integration of SPSS Statistics</li> </ul>
<b>Deployment</b>	<ul style="list-style-type: none"> <li>Export models using SQL or PMML (the XML-based standard format for predictive models)</li> <li>Use IBM SPSS Collaboration and Deployment Services for innovative analytics management, process automation and deployment capabilities</li> </ul>
<b>Modeler server*</b>	<ul style="list-style-type: none"> <li>Use in-database mining to build models in the database using leading database technologies and leverage high-performance database implementations</li> <li>Use SQL-pushback to push data transformations and select modeling algorithms directly into your operational databases</li> <li>Leverage high-performance hardware, including IBM System z® machines, to experience quicker time-to-solution and achieve greater ROI through parallel execution of streams and multiple models</li> <li>Transmit sensitive data securely between SPSS Modeler Client and SPSS Modeler Server through secure socket layer (SSL) encryption</li> </ul>

\*Requires Modeler Professional Server

## About IBM Business Analytics

IBM Business Analytics software delivers actionable insights decision-makers need to achieve better business performance. IBM offers a comprehensive, unified portfolio of business intelligence, predictive and advanced analytics, financial performance and strategy management, governance, risk and compliance and analytic applications.

With IBM software, companies can spot trends, patterns and anomalies, compare “what if” scenarios, predict potential threats and opportunities, identify and manage key business risks and plan, budget and forecast resources. With these deep analytic capabilities our customers around the world can better understand, anticipate and shape business outcomes.

### For more information

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# IBM SPSS Modeler Server performance and optimization

*Improve performance and scalability in high-volume environments*



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## Introduction

Data mining offers organizations many benefits, including a more detailed view of their customers or assets, a clearer view of current conditions and deeper insight into future events. By choosing a high-performance data mining tool, organizations can mine their data more efficiently and gain a significant return on investment (ROI) by understanding the patterns in their data, allowing better decisions to be made which drive superior outcomes.

IBM® SPSS® Modeler is a data mining workbench that enables improved decision making with quick development of predictive models using business expertise and quick deployment of these models into business operations. Designed around the industry-standard CRISP-DM (CRoss Industry Standard Process for Data Mining) model, SPSS Modeler supports the entire data mining process, from business understanding through to deployment.

SPSS Modeler uses a client/server architecture, allowing resource-intensive operations to be executed on a server. This results in increased performance because memory-intensive operations can be done on the server without downloading data to the client computer. IBM® SPSS® Modeler Server also provides support for SQL optimization and in-database modeling capabilities, delivering further benefits in performance.<sup>1</sup>

This benchmarking document provides a guide to SPSS Modeler Server's capabilities and possibilities, and serves as a guide to understanding and maximizing SPSS Modeler Server performance. Thus, the initial sections of this document focus on SPSS Modeler Server's out-of-the-box performance while the remaining sections describe more general SPSS Modeler performance optimizations and sizing requirements.

Specifically, many of the results provided in this document address SPSS Modeler Server performance as it relates to issues of scalability. By utilizing options only available in the server version (such as SQL pushback/generation, in-database mining and caching, User Defined Functions (UDFs) and very large dataset (VLD) options), SPSS Modeler Server-enabled streams demonstrate improved performance and a quicker return on IT investment.

## Performance and scalability

SPSS Modeler Server has been designed and developed to provide high performance and scalability for all data mining tasks. For example, SQL generation and parallel processing are performed automatically. As a result, SPSS Modeler users do not need to make any changes to the way they work to get consistently high performance.

To benchmark performance, we measured the ability of SPSS Modeler Server to carry out the common tasks of data preparation, model building and model scoring using a variety of operating environments and altered the size of the data files.<sup>2</sup> Data mining involves more than simply model building and model scoring, with a large component of the process involving data preparation. Therefore this paper also includes tests evaluating the performance of common steps such as reading, sorting, aggregating, merging and writing data.

### Reading data

Times have been recorded for reading the data sets into SPSS Modeler using the stream shown in Figure 1. The Sample node in these test streams means that we are able to record just the time taken to read the data in (no data write time was added).

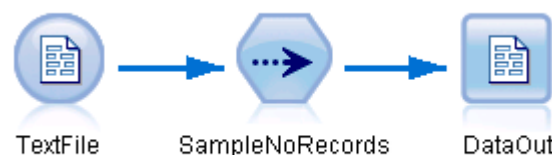


Figure 1: Test stream to read the data into SPSS Modeler.



Many of our benchmark tests show that SPSS Modeler Server's performance is consistent when different types of datasets (such as CSV files and database tables) are used and when these sets are scaled by the number of rows or columns (Figure 2). The execution times show that SPSS Modeler performs in a relatively linear manner as the data sets are scaled up for CSV files, SPSS .sav and database tables.

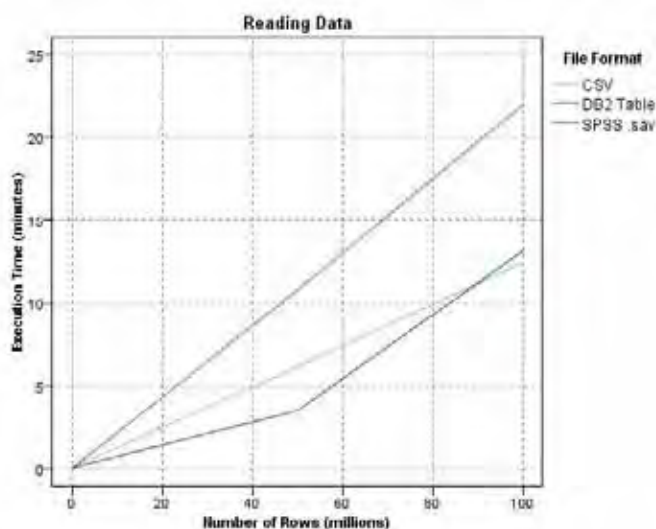


Figure 2: Comparing the data formats read into SPSS Modeler. The CSV and SPSS .sav files were stored locally on the server system and the DB2 database was running on a remote system.

The performance of Excel and XML file formats were also tested, however, because the reading performance was not expected to be as good as the other file formats, these tests were run for a smaller set of data files. The results shown in Figure 3 verified the expectation of slower times for the Excel and XML format.

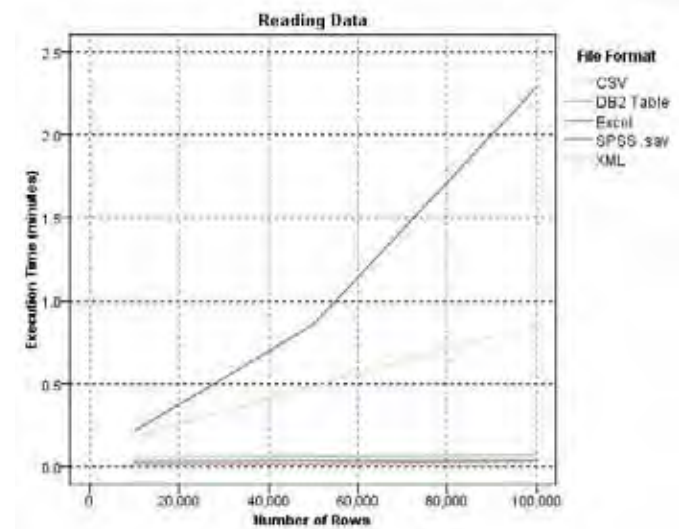


Figure 3: Comparing the data formats read into SPSS Modeler. Excel and XML were the slower performing data formats.

### Sorting data

The sorting test involved sorting the data sets by three columns, using the stream shown in Figure 4. In order to provide a more realistic reflection of a customer scenario, the times include how long it took to read the data as well as the time taken to sort.

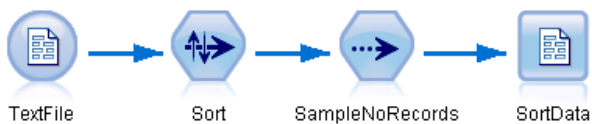


Figure 4: Test stream for sorting data with SPSS Modeler.

Figure 5 shows that SPSS Modeler's sorting performance performs in a linear manner as the number of records sorted is increased. The test results show that the use of SQL pushback functionality provides a significant increase in performance for the sorting operation. The increase in performance is because by enabling SQL pushback within a stream, the SQL instructions are pushed back and executed in the database itself.

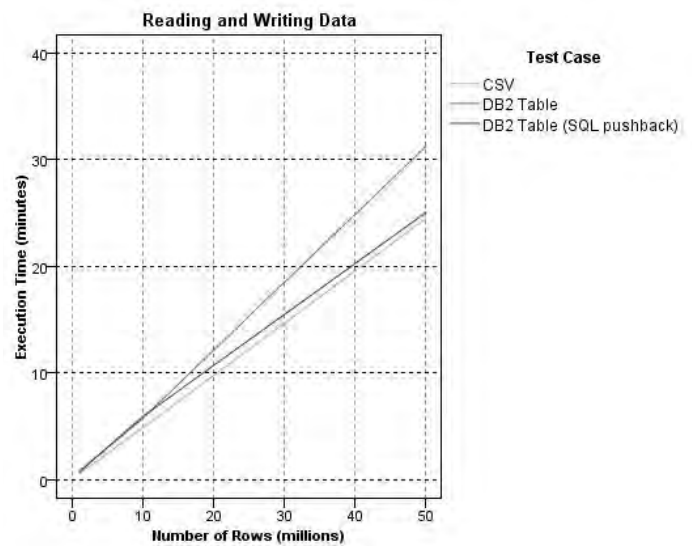


Figure 5: Sorting data with SPSS Modeler. SQL pushback improves the performance when using a database. The CSV file was stored locally on the server system and the DB2 database was running on a remote system.

### Data aggregation

A five million record data set was used to test aggregating with SPSS Modeler by scaling the number of unique values appearing in the designated field using the stream shown in Figure 6. In order for the test results to truly reflect how it would be used in an operating environment, the times measured for the SQL pushback also include the time it takes to read in the data.

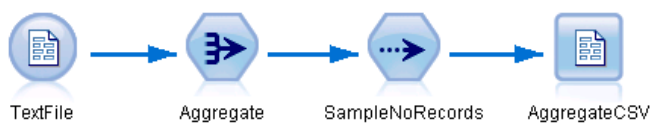


Figure 6: Test stream to aggregate data with SPSS Modeler.

The test results show that the aggregation operation scales well as the number of unique categories to be aggregated increases. Figure 7 highlights the performance times which again highlight the drastic improvement in SPSS Modeler's SQL pushback functionality when performing aggregation using a database table as the source data compared to a CSV file. With SQL pushback the process was complete in almost half the time of the CSV file.

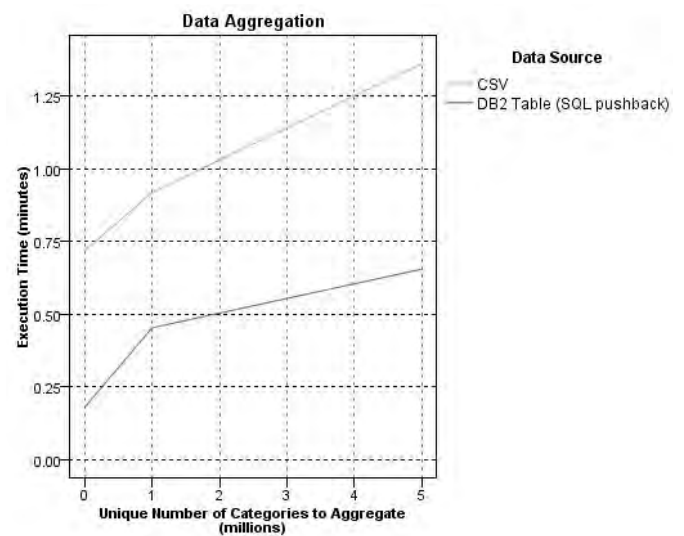


Figure 7: Aggregating data with SPSS Modeler. Using SQL pushback within DB2 was almost twice as fast as a CSV File.

### Merging data

To check the merge operation's performance, times were recorded as the size of the data sets increased, using the stream in Figure 8. An inner join was performed using a unique "ID" column, meaning that the merge was a one-to-one merge. In other words, every record in the first data set had only one match in the second data set.

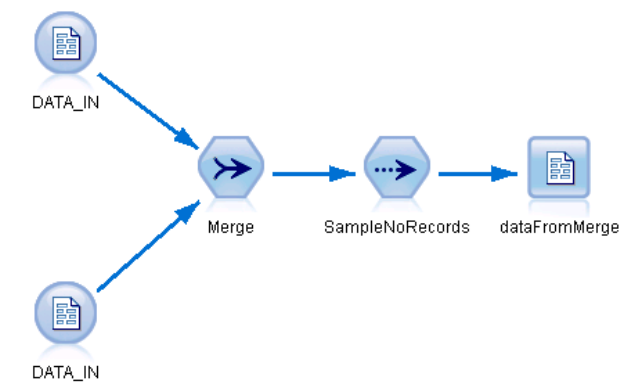


Figure 8: Test stream to merge data with SPSS Modeler.

The test results show that the merge operation scales relatively linearly in relation to the number of records being merged in Figure 9. Yet again, the improvement in time with the use of a database and SQL pushback is evident. This is because when a merge is performed using SQL pushback, the merge has already taken place before the data is read out of the database and then brought into SPSS Modeler. Therefore, the times in this section include the time taken for the data to be read into SPSS Modeler.

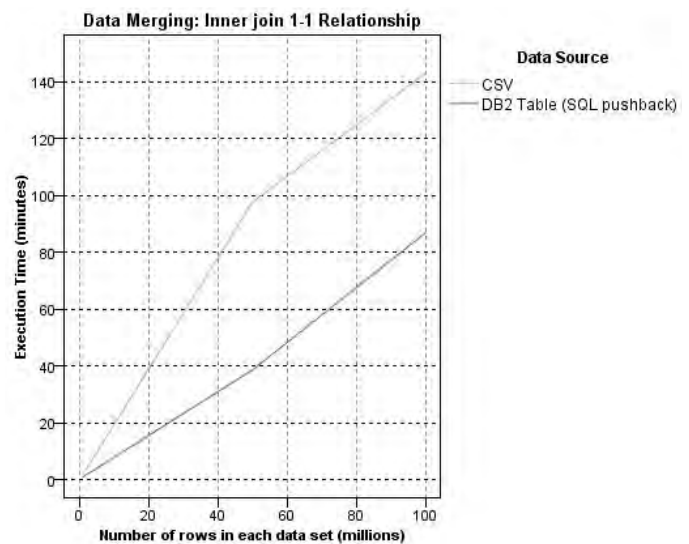


Figure 9: Merging data with SPSS Modeler. When a merge is performed using SQL pushback, the merge has already taken place before the data is read out of the database into SPSS Modeler.

## Writing data

Next, we measured the writing of data out to a CSV file, SPSS .sav file, Excel file, XML file and DB2 database tables using the stream shown in Figure 10.



Figure 10: Test stream to read and write data with SPSS Modeler.

When executing streams of this nature, it is not possible to separate the data writing performance from the data reading performance because SPSS Modeler performs the reading and writing operations at the same time. In other words, before all the data has been read in, the data writing operation has already begun. Consequently, the times shown include both the reading and the writing of data.

Figure 11 illustrates the linear performance as the data sets are scaled up for CSV files, SPSS .sav and database tables. The CSV and SPSS .sav files are stored locally on the server system and the DB2 database is running on a remote system. Please note that the “Via ODBC” setting was used when writing data to the database.

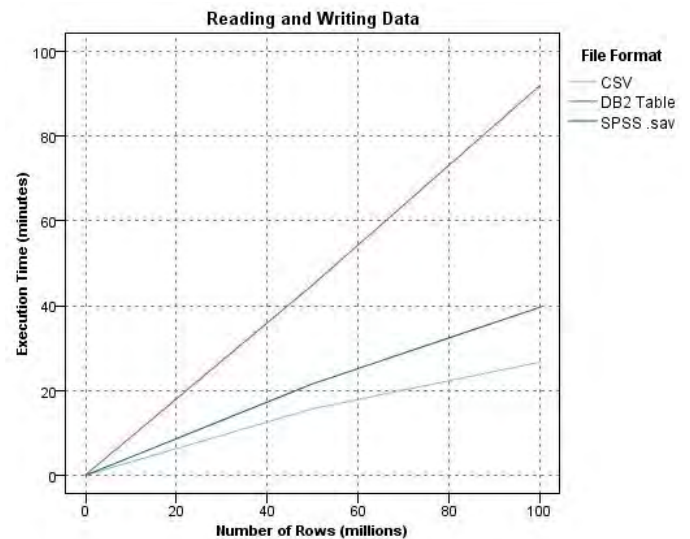


Figure 11: Reading and Writing data with SPSS Modeler. As the read and write operations occur simultaneously, the time includes both.

To keep consistency with the read testing, the performance of Excel and XML file formats run on a smaller set of data as shown in Figure 12. The recorded times for these tests show that the slowest performing file format is the Excel format, which is not surprising given that the elapsed times include the reading of the file as well as the writing. It was also the slowest in the read test.

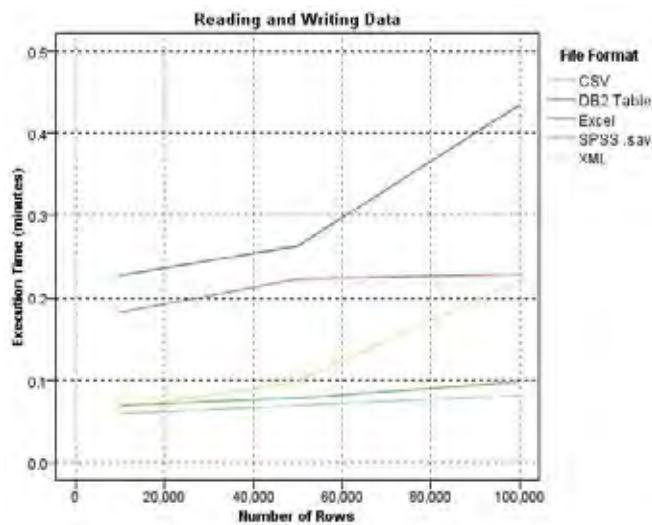


Figure 12: Reading and writing data with SPSS Modeler. Excel remained the slower performing data format. The times include both read and write operations.

### Model building

Figure 13 shows an example stream that was used to conduct the testing for the model building execution in SPSS Modeler.

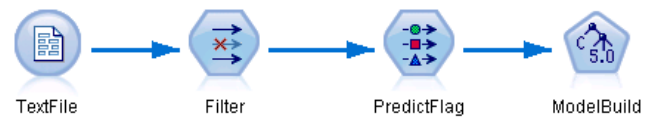


Figure 13: Test stream used for model building – in this case a C5.0 model.

The dataset used contained up to 500,000 records and each model was built independently. However to allow for easier comparisons of the models, the results have been put together into four groups:

- classification models
- segmentation models
- association models
- automated models

Classification models use the values of one or more input fields to predict the value of one or more output or target fields (for example, logistic regression or a decision tree). The majority of the models included in this group (Figure 14) completed building in less than 30 seconds. The slowest model to build was the Neural Net, which does take a longer amount of time due to the sophistication and learning that is required by the technique in building of the model.

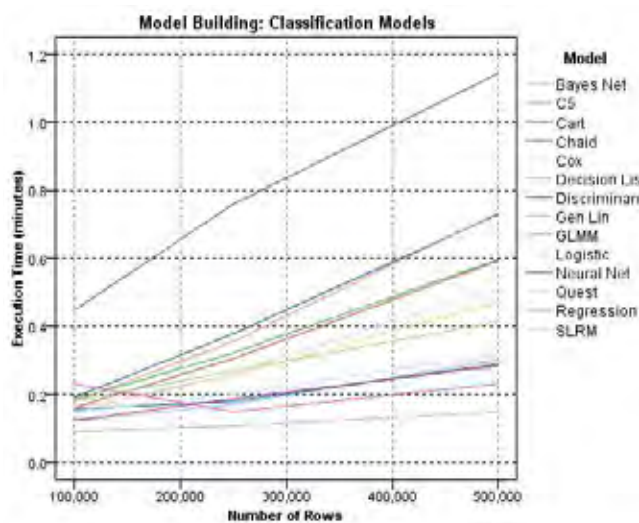


Figure 14: Model building times for classification models in SPSS Modeler. Most of the models completed in less than 30 seconds (0.5 minutes).

Segmentation models divide the data into segments or clusters of records that have similar patterns or characteristics, such as KMeans clustering or anomaly detection. Although the KNN could be included with the classification models, its performance is closer to those in the segmentation group, due to the nature of classifying cases based on similarity to other cases nearby. The Two Step, KMeans and Anomaly were the quicker of the models and finished building around at 29, 47 and 66 seconds respectively on the 500,000 data set.

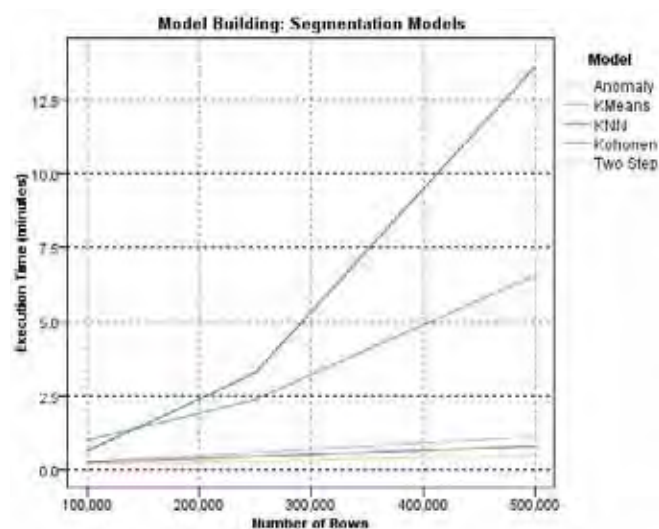


Figure 15: Model building times for segmentation models in SPSS Modeler. The Two Step, KMeans and Anomaly were the quickest of the five models.

Association models are used to find patterns data where one or more entities (such as events, purchases, or attributes) are associated with one or more other entities to construct rule sets that define these relationships. Figure 16 shows that both the Carma and Apriori models were built in less than 15 seconds on the 500k data set (0.25 minutes).

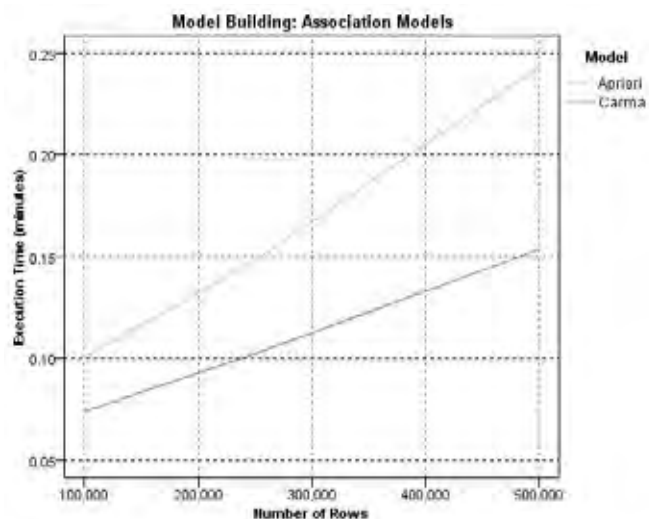


Figure 16: Model building times for association models in SPSS Modeler. Apriori completed in less than 15 seconds while Carma was less than 10.

The automated models (Auto Classifier, Auto Cluster and Auto Numeric) estimate and compare a number of different modeling methods, allowing a variety of approaches to be attempted in a single modeling run. Although ALM (Automated Linear Model) does not use multiple algorithms to build and evaluate, it does contain an automated data preparation step which internally transforms the target and predictor variables in order to maximize the predictive power of the model. Figure 17 shows the three automated models are relatively linear in performance — taking less than eight minutes to build a range of the models on the 500,000 data set and ranking them based on performance. ALM completed its regression model in approximately two minutes.

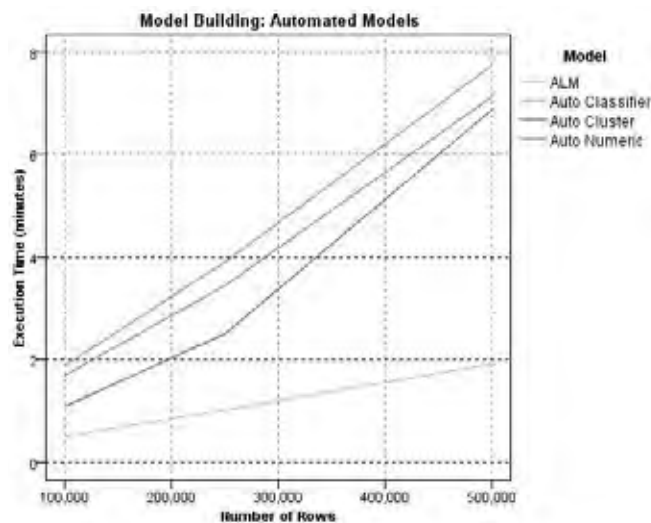


Figure 17: Model building times for the automated models in SPSS Modeler.



## Model scoring

Scoring happens when you take a model and apply it to data to generate a prediction or score. It can be done in batch—for instance, scoring customers each month whose contract is up for renewal next month on their likelihood to cancel. Or it can be done in real time—such as a customer that is on the phone to a call center agent as their risk of cancelling is assessed at that point in time. The model scoring performed in this testing was batch scoring, with the models used for model scoring built using a data set with 10,000 rows and 20 columns. The resulting model was then used in a stream shown in Figure 18 and files of various sizes were then scored.

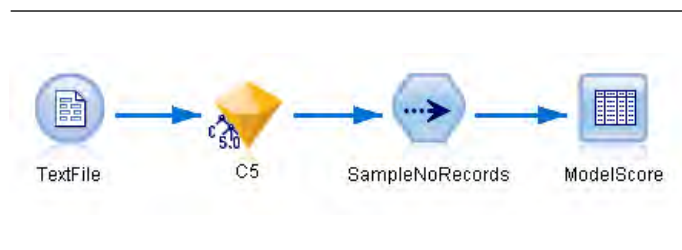


Figure 18: Test stream used for model scoring – in this case a C5.0 model.

The following results show that as the number of records being scored increases, the performance of many models increases to a point and then remains constant. This increase is related to the fact that there is an initial fixed overhead related to the scoring process. This overhead is not related to the number of rows scored, rather a one-off cost. Therefore this becomes less important as the number of rows to be scored increases.

The following three figures illustrate the performance of the scoring models for classification models (Figure 19), segmentation and association models (Figure 20) and automated models (Figure 21). Note that the charts show the scores per second rather than elapsed time to allow for better comparisons between the test cases and your actual data scoring requirement.

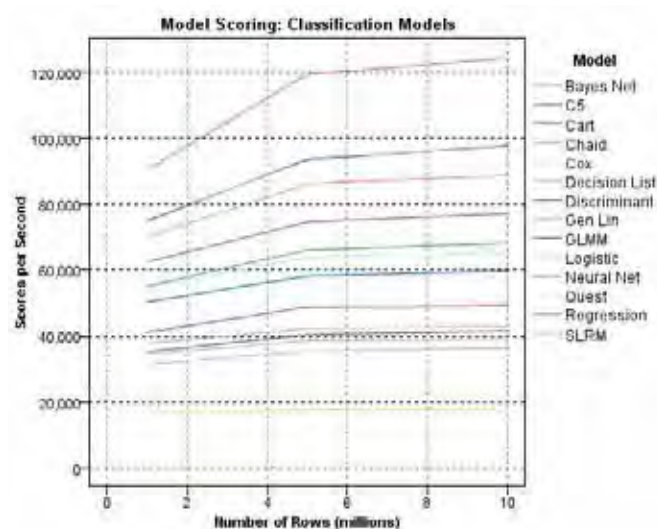


Figure 19: Model scoring times for classification models in SPSS Modeler.

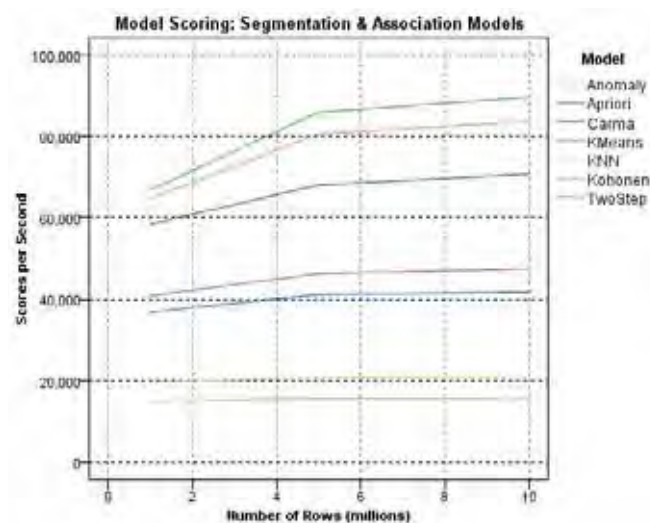


Figure 20: Model scoring times for segmentation models in SPSS Modeler.

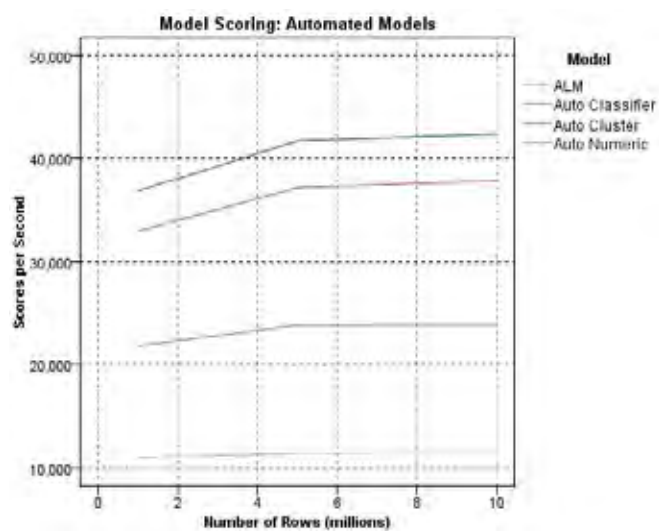


Figure 21: Model building times for the automated models in SPSS Modeler.

## Optimizing performance

Most of the SPSS Modeler Server's high performance is achieved through performance optimizations that are switched on by default. There will be times, however, when analysts and data miners need more control over the optimization of their SPSS Modeler streams. SPSS Modeler Server supports this by providing immediate feedback upon execution.

In Figure 22, the SPSS Modeler stream is executed using SQL generation and the nodes turn purple rather than the usual white. Purple nodes indicate the operations represented by those nodes have been translated into SQL and executed in-database. This feedback helps ensure that as much of the stream as possible is executed in the database. Additional options allow the user to examine the SQL that is generated.

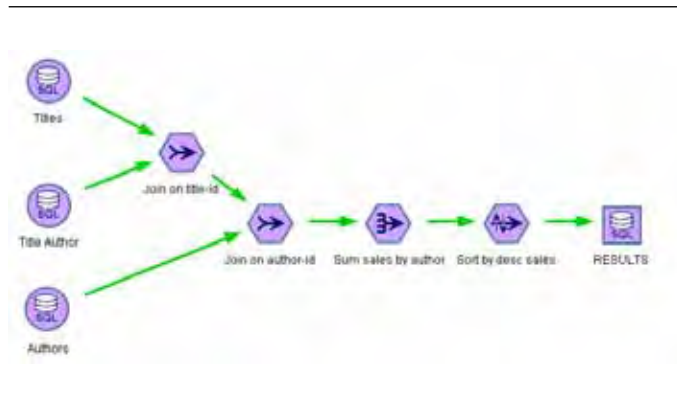


Figure 22: SQL generation and highlighting in a SPSS Modeler stream. The nodes have turned purple to indicate those nodes have been translated into SQL and executed in-database.

## SQL pushback to improve model scoring times

Certain models within SPSS Modeler Server have functionality that allows the SQL to be generated, pushing back the model scoring stage to the database. This allows streams containing these models to have their full SQL pushed back to the database.

The models that support this functionality are:

- C5.0
- Classification & Regression Tree (CART)
- CHAID
- Quest
- Decision List
- Logistic Regression
- Neural Net
- PCA
- Linear Regression

Figure 23 confirms that the model scores per second rapidly increase by enabling SQL pushback. The Logistic regression model experienced a gain of more than 47 percent.

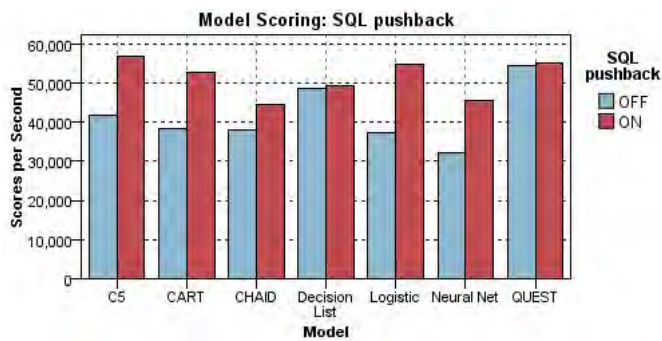


Figure 23: Model scores per second with and without SQL pushback. SQL pushback is a feature only available in the server version of IBM SPSS Modeler.

### In-database mining to reduce data movement

Many organizations have invested heavily in a database infrastructure for predictive analytics and business intelligence systems, but these systems are often under-utilized by the analytical tools that use them. One of the key benefits of SPSS Modeler Server is that it allows organizations to fully utilize their investments in high-performance database systems by taking advantage of database optimization and reducing data movement.

The following vendor algorithms are available in SPSS Modeler for use with the respective database:

- IBM InfoSphere: Association, Clustering, Decision Tree, Logistic Regression, Naive Bayes, Regression, Sequence, Time Series.
- IBM Netezza: Bayes Net, Decision Trees, Divisive Clustering, Generalized Linear, K-Means, KNN, Linear Regression, Naive Bayes, PCA, Regression Tree, Time Series.
- Microsoft SQL Server: Association Rules, Clustering, Decision Tree, Linear Regression, Naive Bayes, Neural Network, Sequence Clustering, Time-Series.
- Oracle: Adaptive Bayes, Apriori, Artificial Intelligence (AI), Decision Tree, General Linear Model (GLM), KMeans, Minimum Description Length (MDL), Naive Bayes, Non-Negative Matrix Factorization, O-Cluster (Orthogonal Partitioning Clustering), Support Vector Machine.

### SPSS Modeler Scoring Adapters

By using SPSS Scoring Adapters, model scoring can be performed in-database to avoid the need to move the data out of the database. This is made possible by installing a set of User Defined Functions (UDFs) that perform the model scoring within the database. The Scoring Adapters include a

very large number of the SPSS Modeler models, to allow for more scoring operations to be moved to the database than just those which can leverage SQL pushback. Scoring Adapters are currently supported for three database types: IBM Netezza, IBM DB2 for z/OS and Teradata.

	SQL pushback	In-database support	Scoring Adaptor support	Read-Write (no SQL pushback)	Read only (no SQL pushback)
IBM DB2 Enterprise Server Edition	X	X			
IBM DB2 for i (formerly i5/OS)	X				
IBM DB2 for z/OS	X		X		
IBM Informix				X	
IBM Infosphere Classic Federation Server for z/OS					X
IBM Netezza Data Warehouse	X	X	X		
Greenplum Database	X				
Microsoft SQL Server	X	X			
MySQL				X	
Oracle Database	X	X			
Salesforce.com					X
SAP Hana	X				
SAP Sybase IQ	X				
Teradata	X		X		

*Table 1:* A high level summary of the in-database capabilities of supported databases.

### Intelligent SQL generation within stream execution to improve performance

SPSS Modeler Server intelligently re-orders operations in the SPSS Modeler stream to maximize performance without altering results. Analysts or data miners can organize streams in a way that makes sense to them, while SPSS Modeler Server reorganizes those operations in a way that makes sense to the database. Figure 24 contains a “Derive” node which contains an operation that cannot be carried out in the database, whereas the “Select” node can be pushed back to the database, as indicated by its purple color.



Figure 24: SPSS Modeler Server optimizes the process so that the “Select” operation is performed before the “Derive” operation, reducing data transfer and improving performance.

### In-database caching

One common user optimization is to set up a cache on a node. The next time data is passed through that node, the cache is filled with that data. From then on, the data is read from the cache rather than from the data source. This can be a useful way to ensure that expensive data processing is only executed once.

Normally, the cache is stored as a temporary file on the file system, but SPSS Modeler Server also supports the caching of this data into a temporary table in the database. When combined with SQL optimization, this may result in significant gains in performance. By automatically generating SQL for all downstream nodes, performance can be improved further. In Figure 25, the “Merge” operation is highlighted, indicating that the operation is being executed in the database from the filled database cache.



Figure 25: Setting a cache on a node that is likely to be re-executed will store the data in a temporary table on the database (where possible), allowing further in-database operations from that node on.

### Optimizing for very large data sets

SPSS Modeler Server features options associated with the selected models, allowing the users to specify that they are working with very large data sets (VLD—referred to as “PSM” options during benchmark testing). Essentially these work by dividing the data into smaller data sets and building one model on each data set. The most accurate models are then automatically selected and assembled to create a single final model nugget. The tests, outlined below, focused on the scalability of the VLD options and were tested for comparison with a Neural Net model. These tests demonstrated considerable time savings when working with VLD and leveraging SPSS Modeler Server’s VLD options on multi-processor machines.

This test was run building the Neural Net model using data ranging from one million records to ten million records.<sup>3</sup> By taking advantage of a system’s additional CPUs and parallel processing, the PSM test used approx 20 GB of the systems large RAM capacity while increasing performance.

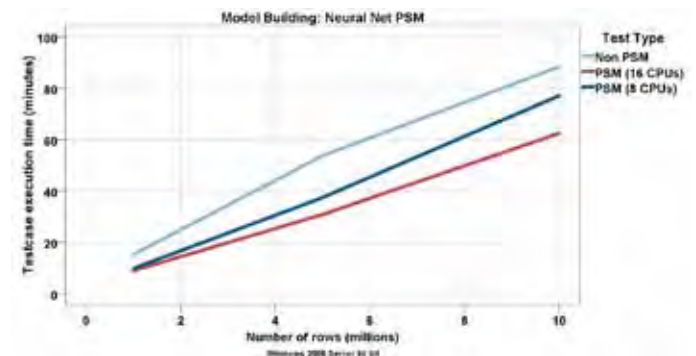


Figure 26: SPSS Modeler PSM functionality can take advantage of a system’s additional CPUs in order to use parallelism to increase the performance of the Model building functionality.

### Advanced performance optimization

Aside from in-database mining, caching, modeling and scoring, SPSS Modeler and SPSS Modeler Server provide a number of additional capabilities that enable data miners to optimize the performance of their streams.

### Database bulk-loading to relieve bottlenecking

Data movement is often a bottleneck in performance—especially when writing to a database. SPSS Modeler provides a number of features to optimize this process for large data volumes. By default, writing to a database is performed on a row-by-row basis. This prevents errors and provides data security but slows performance. Allowing SPSS Modeler to commit multiple rows at a time is a good way to ensure more reasonable performance—and this option is available by default.

In addition to the batch committal of records, SPSS Modeler supports two types of bulk loading. One is provided through ODBC bulk loading facilities and the other uses an external bulk loading tool to allow a database-native solution (Figure 27).

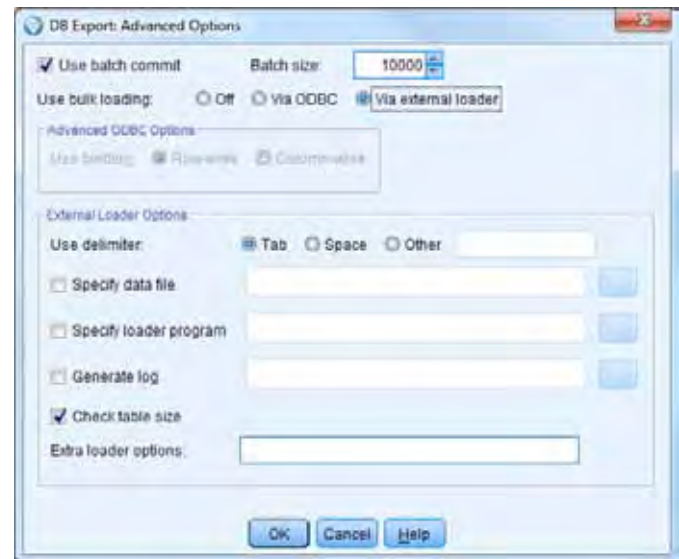


Figure 27: The DB Export: Advanced Options dialog box easily enables bulk loading to the database via ODBC or through an external loader.



External bulk loading scripts are provided for IBM DB2® Intelligent Miner® for Data, IBM Netezza Performance Server, IBM Redbrick® Warehouse, Microsoft SQL Server, Oracle Data Miner and Teradata Warehouse databases. These scripts can be customized and custom scripts may be written for other databases.

### Database indexing

Indexing database tables maintains the performance of in-database options. Correct indexing significantly impacts many subsequent database operations.

SPSS Modeler Server enables users to create indices on tables exported from SPSS Modeler (Figure 28). Simple indices can be created easily. SPSS Modeler also allows users to customize the SQL statement used to create the index (for instance, to create a BITMAP, UNIQUE, or FILLFACTOR index).



Figure 28: Create indices on database tables from within IBM SPSS Modeler Server to improve database performance.

### Optimized joins and sorts

By default, SPSS Modeler has to make assumptions about the state of data in the system. For example, SPSS Modeler cannot assume that any data has already been sorted. Therefore, many operations ensure a sort is performed even if such a sort is redundant. SPSS Modeler allows the user to optimize a “sort” or “join” operation by specifying any existing sorts on the data. This eliminates redundancy and improves performance.

Users can also optimize the performance of SPSS Modeler through special case algorithms for joins. SPSS Modeler’s default join algorithm is designed to perform optimally when joining data sets of similar size.

In some very common operations, such as when using a join to connect an ID in one table to a label or description from another (for example, joining a product code in a table of transactions to a product name in a look-up table), the default join is inefficient. SPSS Modeler offers an alternate join algorithm for these situations which significantly boosts performance speed.

### Parallel processing to improve performance

Symmetric Multi-Processor (SMP) machines are widely used and available for all platforms supported by SPSS Modeler Server. They comprise multiple CPUs sharing access to the same memory, disk, network and other I/O resources. When a multi-threaded application runs on an SMP box, threads may be distributed across the CPUs and execute truly in parallel. Application processes and individual threads can usually migrate dynamically between CPUs to balance processor load. This is generally handled transparently by the operating system.

SPSS Modeler uses a parallel data sorting algorithm to improve the performance of a number of data processing operations. Sorting is used by many SPSS Modeler operations including binning, model evaluation, merge and the sort operation itself. All of these operations benefit from the parallelization of the sort operation.

The parallelized sort algorithm uses a technique called “record parallelism.” This technique assigns records on a round-robin basis to separate sorting processes. Each process sorts its own subset of records and the results are joined. Sort times can be reduced by more than 30 percent when running on multi-processor hardware and at high data volumes.

### Scoping and sizing SPSS Modeler Server

Many factors must be considered when scoping hardware requirements for an SPSS Modeler Server installation. The breadth of operations and differences in data volumes make it difficult to estimate performance for any specific hardware configuration.

#### Impact of CPUs on performance

Obviously the core speed of any individual CPU will impact data mining performance. Almost all data mining operations – especially modeling — are heavily processor dependent, so an increase in CPU speed will produce a proportional increase in performance for many SPSS Modeler processes.

The main benefits of multiple CPUs (or multicore CPUs) occur when running multiple streams. This means that the number of users will often be the deciding factor in determining the optimum number of CPUs. Multiple CPUs will also benefit parallelized operations, but the main benefits will be from supporting multiple users (Table 2).

Number of users	Number of CPUs
1-2	1
3-4	2
5-10	4
11-20	8
21+	16

*Table 2:* CPU recommendations for Modeler Server based on the number of users.

For a production server running scheduled data mining via IBM® SPSS® Collaboration and Deployment Services, the number of CPUs should be determined by the number of separate processes to be performed simultaneously. Maximum performance can be achieved, for instance, by splitting a model scoring process across multiple CPUs or building multiple models simultaneously.

### **Impact of physical memory on performance**

Most SPSS Modeler operations can be performed on large volumes of data with minimal memory usage. Only certain operations, such as sorting, joining, and modeling, require data to be temporarily stored in memory. If not enough memory is available, these operations will store part of the data as virtual memory on disk. This can affect performance, since disk access is significantly slower than memory access. As with CPU usage, the number of users impacts the required memory for normal operation. Memory requirements depend on data volume.

### **Impact of disk space on performance**

Before addressing disk space requirements, it is important to understand the volume of data that is likely to be used for the actual data mining. Most organizations store many terabytes of data — especially transactional data — but this amount will rarely be used. Normally the data is aggregated, selected or sampled before it is used for analysis. While large data volumes are typically used in model scoring, the model scoring processes usually rely on operations that do not use a lot of system resources.

When trying to maximize performance, disk usage for data processing steps can be relatively high. The user often caches data to minimize execution times, and some operations will “spill to disk” when physical memory is unavailable. In addition, some operations may produce a dataset larger than the raw input data, further increasing disk requirements.

Given that the large data preparation steps are typically executed infrequently (it is best practice to store the results of such processing as intermediate files or tables), a conservative rule of thumb is to reserve between three to five times the disk space required to store the original data.

## Conclusion

SPSS Modeler Server's combination of high performance, scalability, performance optimizations and flexible hardware requirements enable it to handle large and complex data mining projects. With SPSS Modeler Server, organizations can:

- Maximize their investment in high performance databases for all data mining tasks —ensuring high performance and minimizing data transfer costs.
- Leverage SQL pushback and Scoring Adapters generation to improve performance.
- Use in-database caching, database write-back with indexing and optimized merging to join tables outside of the database.
- Incorporate data mining algorithms from other database vendors.
- Maximize use of multiple CPUs (or multi-core CPUs) in an operating environment by using parallel processing during a number of data preparation and model-building operations.

The ever-growing amount of data created by organizations presents opportunities and challenges for data mining. Scaling the entire data mining process with SPSS Modeler Server makes it possible for your organization to analyze large volumes of data efficiently—reducing the time needed to turn data into better business decisions that boost your ROI.

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1 See <http://www-01.ibm.com/software/analytics/spss/products/modeler/edition-comparison.html#c>

2 Server was a Windows Server 2008 R2 Enterprise x64 Edition 64-bit, with Intel Xeon 5450, 3.00GHz dual processor with 4 GB RAM and 400 GB Hard Disk Drive and 4GB paging file size / swap space.

3 These tests were run on a high specification Windows Server system with 16 CPUs and 100GB RAM.



Please Recycle

## **Agent-Based Social Simulation in the Service of Child Welfare Issues: Defining the Demand for Group and Residential Care**

Dr. Fred H. Wulczyn, Chapin Hall Center for Children at the University of Chicago  
Dr. John R. Hummel, Advanced Simulation Technologies Center, ANL/DIS

### **Introduction**

Chapin Hall researchers have a long track record of bringing advanced analytical techniques to bear on issues affecting children, ranging from clinical research using randomized trials to system dynamics modeling of process flows to observations of complex system behavior using chaos theory to search the high-dimensional state space for hidden structures in the data. Chapin Hall's keen appreciation of the U.S. child welfare apparatus as an emphatically complex system led them, in the fall of 2006, to explore the potential benefits of collaboration with ASTC to see if technologies such as agent-based simulation might help unlock some of the mysteries of their problem domain. Argonne's ASTC has, for well over a decade, been an incubator for advances in fine-scale, multidisciplinary simulation of heterogeneous, complex systems, including, for example, clinical, physiological and logistical simulations of healthcare delivery, adaptive social dynamics of the South American cocaine trade, and studies of the socioecological sustainability and social stability of settlement systems under stress, both in ancient (Mesopotamia) and modern (Southeast Asia) milieus.

This work has benefitted directly from ASTC's ongoing agent-based simulation R&D, particularly with regard to ASTC's work, in collaboration with the RAND Corporation, on simulation of potential impacts of national healthcare reform proposals, and in its NSF-sponsored holistic socioecological sustainability studies, being conducted in collaboration with the Oriental Institute of the University of Chicago.

### **Problem Statement**

Each year, state child welfare agencies investigate roughly 3 million reports of child maltreatment. Of those reports, nearly one million are substantiated. Treating abused and neglected children costs federal, state, and local governments about \$20 billion dollars each year, although that figure does not include the added costs of health care, mental health services, or specialized educational services. Given that one-half of the children entering out-of-care have are behind their peers on a wide range of developmental indicators, the true costs of caring for abused and neglected children are much, much higher.

The services available to abused and neglected children are an admixture of in-home and out-of-home services, if services are in fact available. For the most part, maltreated children are not referred for services at all. When children are referred for services, in-home services include parenting classes, homemaker services, counseling, and other supports designed to improve the parents' ability to raise their children safely. When the safety risks to the child are too great, public officials resort to out-of-home care, a course of action that involves locating another home for the child, at least temporarily. Out-of-home care, otherwise known as foster care, ranges from family-based foster care, relative/kinship foster care, group homes, and residential

institutions.<sup>1</sup> Placement occurs in about 25 percent of the cases that are substantiated, a figure that translates into roughly 250,000 admissions annually. Of all the children admitted to foster care, infants and teenagers are the children at greatest risk. Among infants, placement rates per 1000 children of the same age in the general population reach above 5 percent in the poorest areas of the country. All in all, about 1 in 5 children placed in foster care is placed before his or her first birthday. Placement rates per 1000 among teens are lower; nevertheless adolescents (children between the ages of 13 and 17 at admission) account for between 35-40 percent of the children who enter the placement system.

Notwithstanding the large number of children who are left without any service at all, public policy favors in-home services so that a child's family life is not disrupted. When that is not possible, public policy favors placement of children in the most family-like setting, given the needs of the child. That said, for some age groups of children, group and residential care account for more than half of all placements into out-of-home care. In some jurisdictions, the likelihood a teenager will be placed in a group or residential setting goes as high as 80 percent. Even among infants, placement in a group setting is surprisingly high. Recent research carried out at the University of Chicago suggests that group care utilization rates for infants range between 3 and 35 percent. Although we generally think of orphanages as Dickensian relics, the truth is, vestiges of the old way of caring for children are with us still.

What is perhaps most striking about the placement system in the U.S. is how little we use what little we know to pursue better services for what is arguably the nation's most vulnerable group of children. For younger children, particularly those under the age of 1, there is virtually no developmental research that supports the use of group care as an alternative to a single, primary set of caregivers.<sup>2</sup> Even placement with strangers in a family setting has significant iatrogenic effects when very young children are involved. Among adolescents, the research is more equivocal although it leans decidedly toward reducing our reliance on group settings for adolescents who cannot live at home.

Despite the evidence, the practice of placing children into group and residential care persists. The question is why and what can be done to align practice with what is known about the benefits of group care? In our view, the practice of placing children into group settings lingers because the supply of beds dictates the demand.<sup>3</sup> The supply lingers because public officials are

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<sup>1</sup> Group homes usually house between 4 and 12 unrelated children, although the exact capacity is regulated by states. Residential care settings are much larger, with some residential care programs having a capacity for several hundred children who live in cottages on a campus.

<sup>2</sup> To be fair, no state or provider organization advocates raising very young children in a group setting. Placement in shelter care (a form of group care) is thought of as a way to manage demand for placement that oscillates over relatively short cycles. Nevertheless, the supply of shelter beds has become, we believe, its own source of demand.

<sup>3</sup> One example of how demand for residential/group care is governed by the supply comes from New York City. During the latter half of the 1990s and early this decade, the overall number of foster children dropped from slightly less than 50,000 to 25,000 because of a steep drop in the number of admissions. Over that same time period, the population of children living in group care remained virtually constant because the supply of group care beds remained largely unchanged. In the face of declining demand, the persistent level of group care utilization implies micro-level decision processes that are susceptible to the influence of supply.

simply unable to describe the long run demand for group and residential care other than to assert that the demand is not zero. Given the significant bricks and mortar investments residential care represents, providers are unwilling to manage their supply of services up or down without a clear indication of where the market for their services is headed. If the optimal quantity of group and residential care is greater than zero, but less than the current supply (as current research implies), any given provider may simply be waiting to see which one of their competitors downsizes (or goes out of business altogether). In the meantime, use of their beds remains relatively stable as utilization seeks its equilibrium around capacity.

### **Technical Approach**

In technical terms, we see residential/group care as a complex system that exhibits adaptive behavior consistent with the presence of multi-loop feedback mechanisms. The system operates at both the macro-level of governments and other organizations as aggregate, decision-making agents and at the micro level of individual persons as cognitive agents.

The dynamics of the residential/group care issues articulated above play out in the context of a heterogeneous, multidisciplinary complex system: the overall child welfare apparatus. Figure 1 provides a simplified sketch view of the system components relevant to the group care pathway and its various alternatives. The figure depicts flows of individual person agents representing needy children into and out of the various care alternatives. With data available through Chapin Hall, the flows, and the actions undertaken by, and *upon*, the individual person agents can be resolved on essentially a daily basis. In broad terms, children are admitted to a care pathway, receive care, and are released or removed from care, at which point they may not require further care and may leave the system, or may require care and reenter the needy population. The activities that take place in the course of this process are, of course, far more complex than could be shown in the figure.

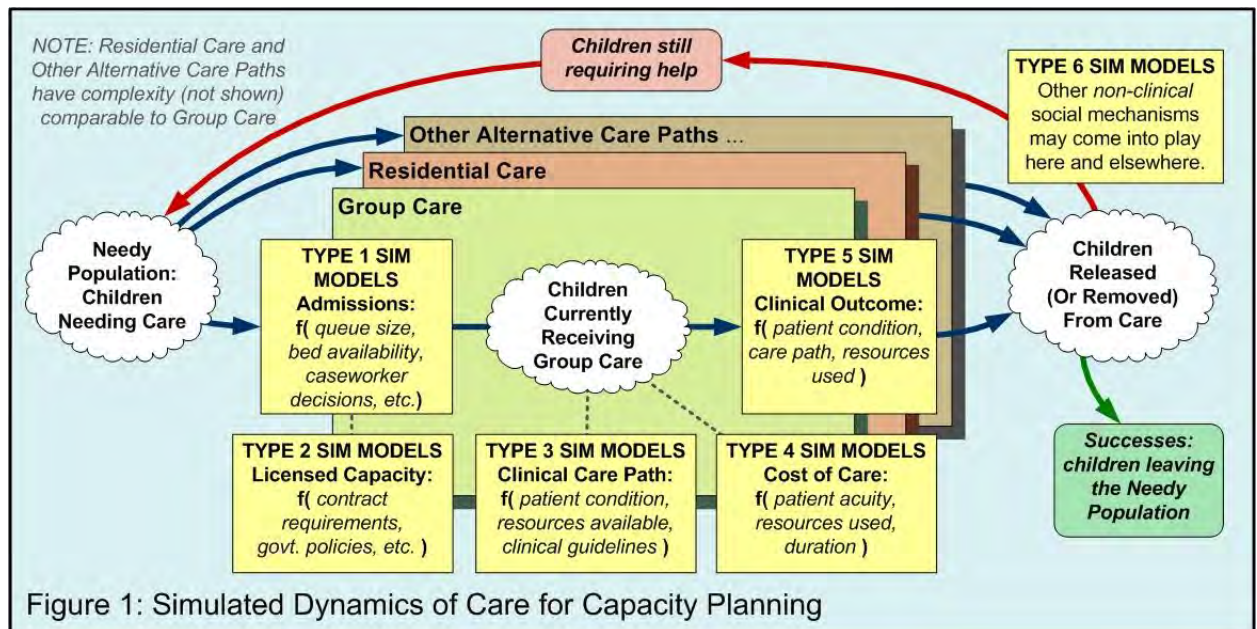
Currently we have developed a model (Ospedale) that utilizes data derived from administrative data sets to parameterize the agent based simulation model. The model can be adjusted by making different assumptions about these parameters. In addition the model can be tuned to operate with subpopulations and those can be simulated as subpopulations or in the aggregate with other subpopulations. There are three distinct *categories* of dynamic simulation models that are now built and operate in the Ospedale modeling environment.

1. Models of decisions to admit children in need of care to one of the care path alternatives, based upon historical data and corresponding statistical models of admissions.
2. Models of changes in licensed system capacity (i.e., number of beds) of facilities due to endogenous and exogenous factors, again based on historical data and statistical models.
3. Models of clinical outcomes, including duration of stay, as a function of individual patient characteristics, demographics, family background, medical history, etc., and the profile of care that the child was given.

In addition plans are in place and to build additional functionality in order to reasonably portray the dynamics of the system and include:



1. Models of monetary cost, resources consumed, and assets tied up, in providing various increments of care, to allow tracking of system performance under a load and to allow integration of total costs, based upon historical data and corresponding statistical models.



2. Summary data on efficacy of the healthcare options exercised in patient care paths can be used to help build these models.
3. Diverse models of other societal processes that may trigger and modulate the response of the child support system, including, for example, interactions with law enforcement, family dynamics (changes in employment status of breadwinners, etc.) and so on.

We continue to build and test this multifaceted simulation system using relatively simple simulation formulations and gradually add complexity and fidelity. We have structured the simulation such that it will be simple to swap alternative models of the various processes in and out of the overall framework, to allow us to try out various alternative hypotheses regarding these complex processes, and see which ones tend to produce the most realistic and reasonable outcomes. This will, of course, make the system far more useful and accessible for other researchers who may wish to use the simulation system in future.

### Data Resources

For the past fifteen years, researchers at Chapin Hall Center for Children, through the Center for State Foster Care and Adoption Data have been amassing the nation's most extensive collection of placement data. Extracted from the administrative records of public children welfare agencies, the data base tracks the full placement history for 1.7 million children in 20 states representing one-third of the nation's counties. In addition, the data have been linked to 1990 and 2000 census data, making it the only source of data for studying temporal and spatial dynamics. Of particular importance, the data support analysis of population dynamics (i.e., modeling admission/discharge dynamics as birth/death processes) at a variety of temporal scales, including daily changes. Finally, the placement data for Illinois has been linked at the child level

to a variety of other administrative data sources, including school records, Medicaid records, and income maintenance data, to name a few other resources.

Most existing research with administrative data focuses on individual (i.e., person-level) experiences/processes. We believe that a socioecological orientation to the problem of extracting knowledge about human built systems ought to be applied. Doing so successfully through simulations methods broadens the range of applicable theory and extends dramatically the range of questions that can be answered with administrative databases. At the same time there is no question that the proposed work constitutes substantial new challenge for high-performance computing, both in mining and sifting the enormous transactional databases needed to extract social behavior pattern vignettes for simulation and in the fine-scale, multi-year simulations of the diverse activities of hundreds of thousands of individual children and caregivers in our agent-based simulations.

### **Proposed Budget**

The project will avail itself of computing resources already on hand at the collaborating institutions, including ASTC's 16-processor AMD Opteron mini-cluster computer, and very likely Argonne's Blue Gene supercluster computer as well, so that no additional equipment acquisitions will be required. All project costs will be used for graduate and undergraduate student labor, as detailed below. The matching contribution from Chapin Hall will fund costs associated with bringing into the modeling building exercise experts with subject matter expertise and to support the involvement of senior level researchers as needed.

***Letters of Commitment***

Chapin Hall

Intelligent Outcome Analytics, LLC

Pierson Computing Connection, Inc.

April 16, 2014

Dr. John D. Fluke  
Associate Director for Systems Research and Evaluation  
Kempe Center for the Prevention and Treatment of Child Abuse and Neglect  
The Gary Pavillion at The Children's Hospital, Anschutz Medical Campus  
13123 E. 16<sup>th</sup> Avenue, B390  
Aurora, CO, 80045

Dear Mr. Fluke:

I am writing to confirm our intention to participate in your proposed work to design and implement a decision support tool that uses predictive analytics to identify service needs for foster children and the elderly.

Should you be able to successfully obtain a contract from the Allegheny County Department of Human Services for this work, we intend to subcontract with you to provide services related to Integrated Outcome Management and Assessment and predictive modeling.

We are prepared to provide appropriate staff and consultants to meet the needs of the project. The proposed work represents a terrific opportunity to apply our expertise in simulation modeling and predictive analytics, and we are looking forward to an opportunity to work with you and the staff at the Kempe Center.

We look forward to learning whether our proposal was successful.

Sincerely,



Fred Wulczyn  
Senior Research Fellow

Intelligent Outcome Analytics, LLC

David R. Schwartz  
Intelligent Outcome Analytics, LLC  
17 Llanfair Road, Suite 1  
Ardmore, Pennsylvania 19003

April 17, 2014

Dr. John Fluke  
University of Colorado Denver  
Department of Pediatrics  
Kempe Center  
13123 E 16<sup>th</sup> Ave., B390  
Aurora, CO 80045

Dear Dr. Fluke:

I am pleased to support your proposal to provide a framework for predictive analytic modeling and predictive modeling services to the Allegheny County Department of Human Services.

I look forward to leading the predictive analytic modeling component of this important project, serving as CO-PI, and collaborating with the project team members and Allegheny County administration and staff.

This is an exciting opportunity to collaborate with internationally respected scholars on a project that successfully aligns the goals/research of the collaborators with the goals of the overall project.

I look forward to collaborating with you on this work.

Best regards,

David R. Schwartz  
CEO, Intelligent Outcome Analytics



April 16, 2014

Dr. John D. Fluke  
Associate Director for Systems Research and Evaluation  
Kempe Center for the Prevention and Treatment of Child Abuse and Neglect  
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Should you be able to successfully obtain a contract from the Allegheny County Department of Human Services for this work, we intend to subcontract with you to provide software and services related to IBM SPSS Modeler and possibly other services as the plan for the project is developed.

We are prepared to provide appropriate staff and consultants to meet the needs of the project. The proposed work represents a terrific opportunity to apply our expertise and services and we are looking forward to an opportunity to work with you and the staff at the Kempe Center.

We look forward to learning whether our proposal was successful.

Sincerely,

A handwritten signature in blue ink, appearing to read "Jeff Martin", is written over a horizontal line.

Jeff Martin  
Director of Sales  
Pierson Computing Connection, Inc.

Pierson Computing Connection, Inc.  
10 Long Lane, Suite 100  
Mechanicsburg, PA 17050